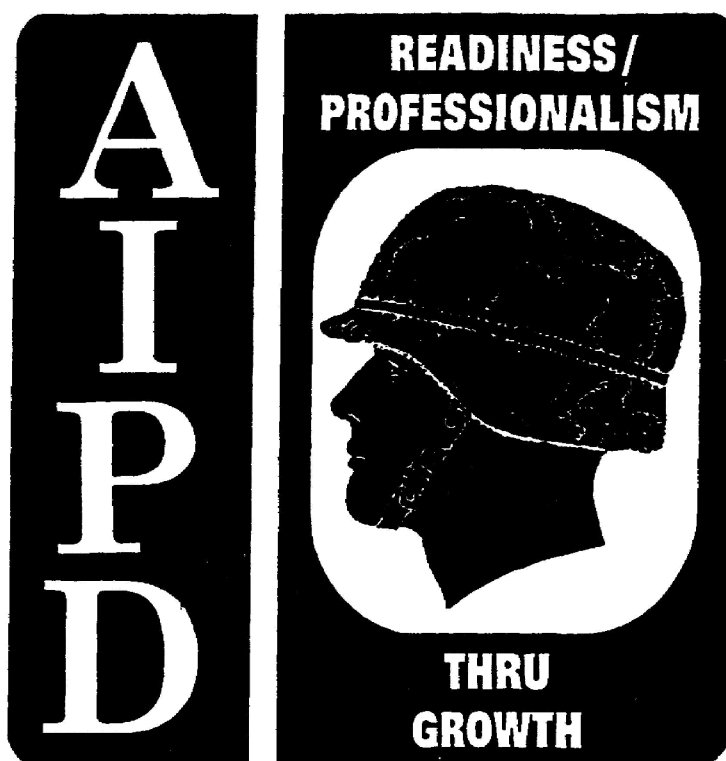


SUBCOURSE
MM 5006

EDITION
7

ALIGNMENT AND ADJUSTMENT
OF AN/FPN-40



THE ARMY INSTITUTE FOR PROFESSIONAL DEVELOPMENT
ARMY CORRESPONDENCE COURSE PROGRAM

ALIGNMENT AND ADJUSTMENT OF AN/FPN-40

Subcourse Number MM 5006

EDITION 7

United States Army Combined Arms Support Command
Fort Lee, Virginia 23801-1809

3 Credit Hours

Edition Date: 31 Mar 1987

GENERAL

This subcourse is designed to teach the knowledge necessary to make alignments and adjustments on the AN/FPN-40. The overall objective of this subcourse is to troubleshoot and repair the radar set. This subcourse has one lesson which corresponds to the terminal objective listed below.

TASK

Describe the procedures for aligning the sine-cosine converters, elevation servo strobe, and the adjustment of the B-trigger delay of radar set AN/FPN-40.

CONDITIONS

Given this subcourse, pencil, and paper.

STANDARD

The standard is met when you can correctly answer 70 percent of the multiple-choice questions of the final examination.

(This objective supports SM Tasks 011-151-4005, Align the Sine-Cosine Converters in Synchronizer Generator SN-386/FPN-40; 011-151-4020, Align the Elevation Servo Strobe of Radar Set AN/FPN-40; and 011-151-4042, Align the Transmitter of Radar Set AN/FPN-40.)

Whenever pronouns or other references denoting gender appear in this document, they are written to refer to either male or female unless otherwise indicated.

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PLEASE NOTE

Proponency for this subcourse has changed
From Aviation (AV) to Missile & Munitions (MM).

INTRODUCTION

1. This parallel resident/extension training package consists of a lesson which is designed to provide you with the skills and knowledge necessary to align sine-cosine converters in synchronizer-generator SN-386/FPN-40, the elevation servo strobe; and adjust the B-trigger delay of radar set AN/FPN-40. (See Figure 1.)

2. Radar set AN/FPN-40 is a lightweight radar that can be transported by truck or helicopter. The AN/FPN-40 operates in the 9,000 to 9,160 megahertz frequency range.

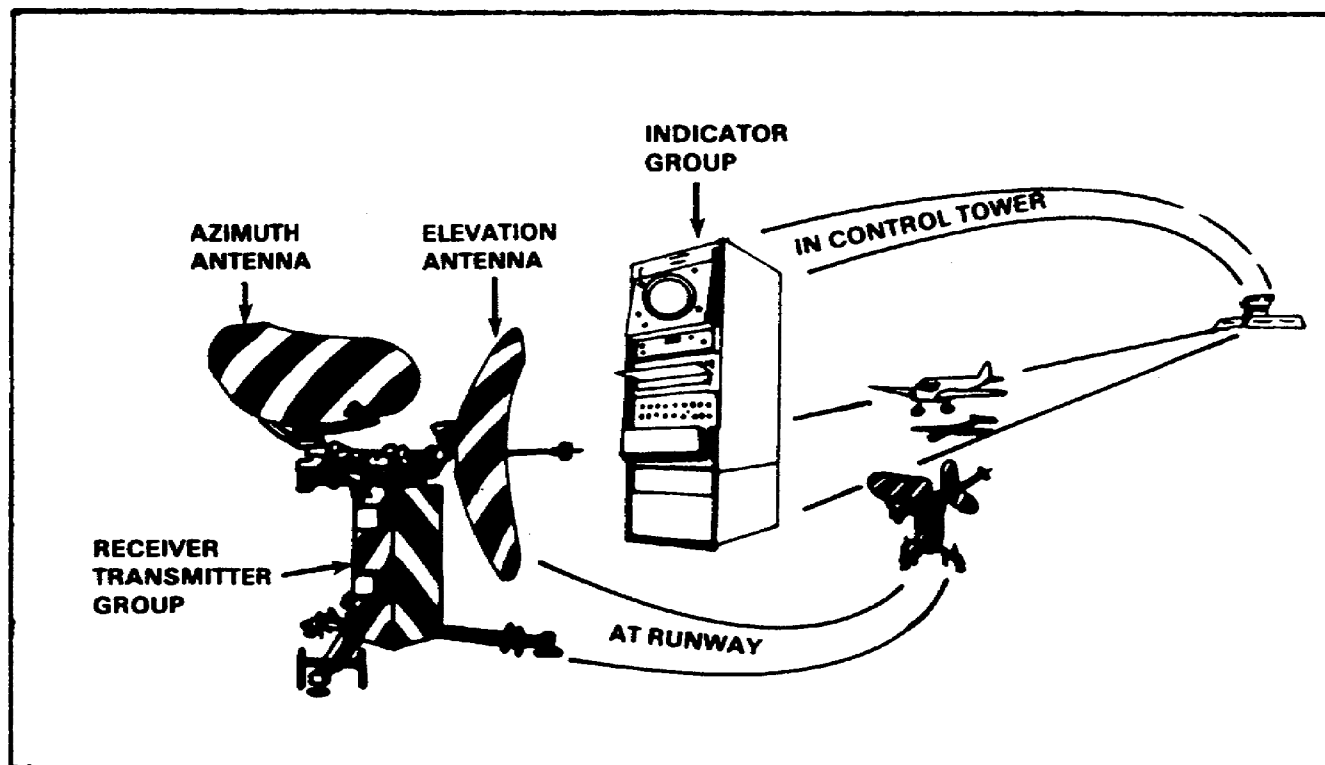


Figure 1. GCA radar set AN/FPN-40.

3. The radar set AN/FPN-40 has four separate functions: Surveillance, height finder, final approach, and taxi. (See Figure 2.)

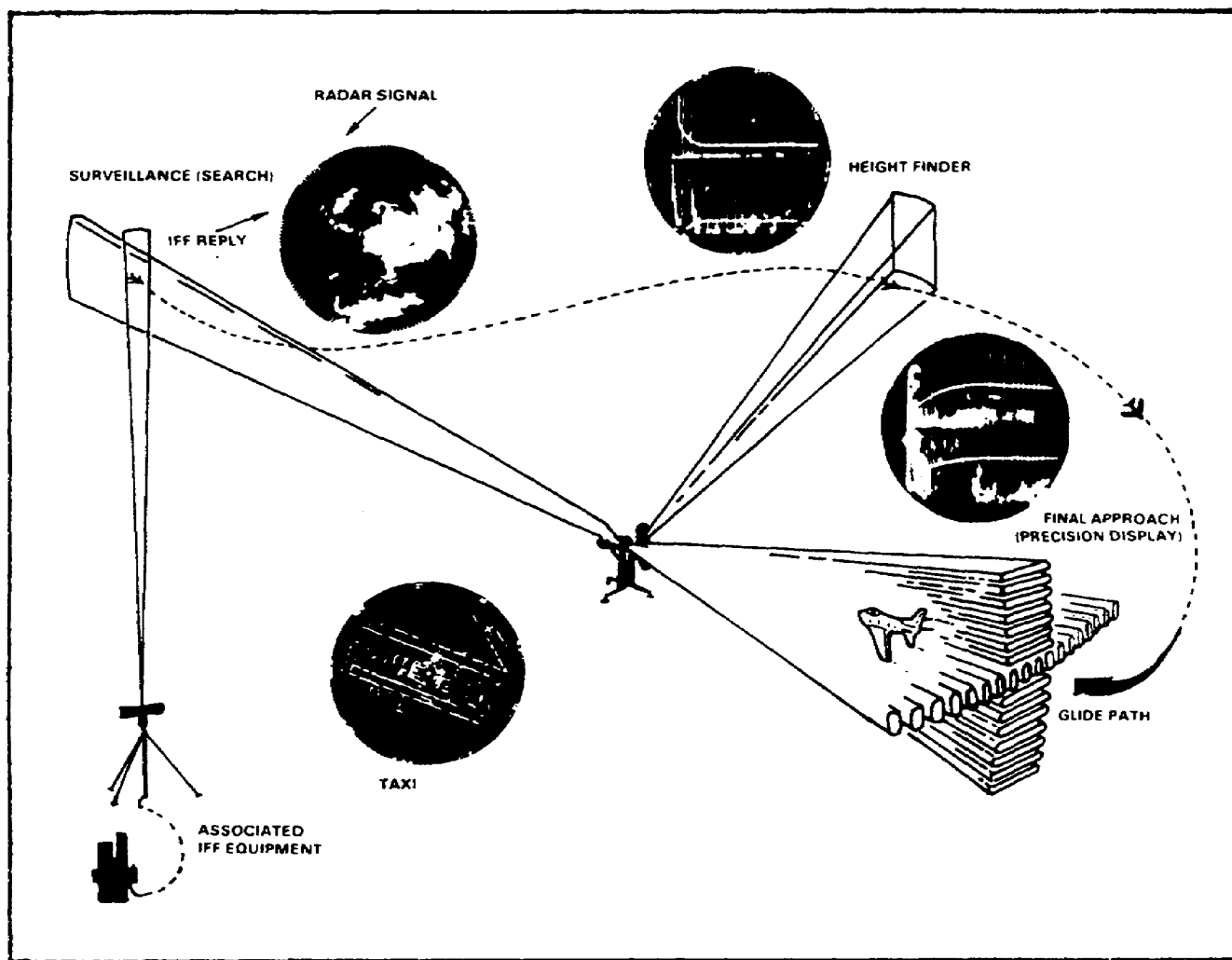


Figure 2. Functions of radar set AN/FPN-40.

a. The surveillance function is used to detect small air-craft within a radius of 25 miles and large aircraft within a radius of 40 miles.

b. The height finder function is used to determine the height of an aircraft if the aircraft is within 30 miles of the airfield and between 506 and 50,000 feet in altitude.

c. The final approach function is used to guide the air-craft along the proper glide path and course line to the touchdown point.

d. The taxi function gives a plain view of the airfield runways and taxi strips. This permits the operator to control ground traffic.

LESSON

ALIGNMENT AND ADJUSTMENT OF AN/FPN-40

TASK

Describe the procedures for aligning the sine-cosine converters, elevation servo strobe, and the adjustment of the B-trigger delay of radar set AN/FPN-40.

CONDITIONS

Given this subcourse, paper, and pencil.

STANDARD

The standard is met when you can correctly answer 70 percent of the multiple-choice questions of the final examination.

REFERENCE

TM 11-5840-293-35.

Learning Event 1:

ALIGN SINE-COSINE CONVERTERS IN SYNCHRONIZER GENERATOR, ELECTRONIC MARKER SN-386/FPN-40

1. The alignment of the sine-cosine converters is performed to ensure the position of the radar time base sweep on the CRT is synchronized with the antenna position (azimuth), and to ensure that the radar time base sweep is linear on the CRT. This Learning Event 1 covers the sine-cosine alignment of both radar and IFF sine-cosine converters. If AN/FSQ-84 system is not available, perform only radar sine-cosine converter alignment. This event will enable you to perform the following:

a. Locate and identify various operator controls on the control-indicator group OA-2664/FPN-40.

b. Locate and identify components on the receiver-transmitter group OA-2667/FPN-40.

c. Locate and identify adjustment controls and test points on the sine-cosine converter portion of the synchronizer generator, electronic-marker SN-386/FPN-40.

2. Location and identification of components and controls.

a. Locate the control-indicator group OA-2664/FPN-40 of radar set AN/FPN-40. (See Figure 1.)

b. Locate the following components on control-indicator group OA-2664/FPN-40. (See Figure 3.)

- (1) Panel power distribution SB-1116/FPN-40.
- (2) Indicator azimuth elevation range IP-800/FPN-40.
- (3) Control radar C-2074/FPN-33.
- (4) Synchronizer-generator, electronic-marker SN-386/FPN-40.
- (5) AC convenience outlets.

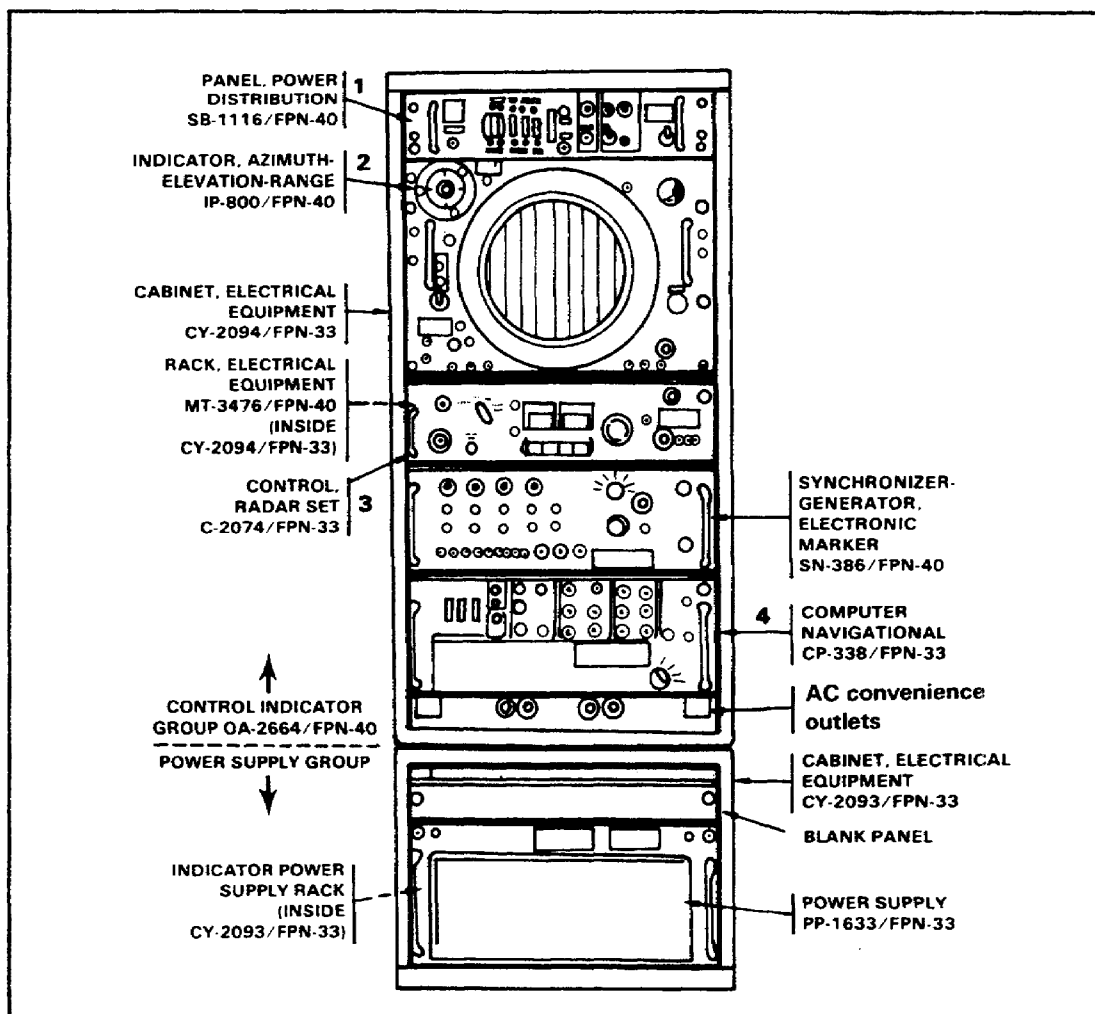


Figure 3. Control indicator group OA-2664/FPN-40.

c. Locate SCAN switch S-305 on power distribution panel SB-1116/FPN-40.
(See Figure 4.)

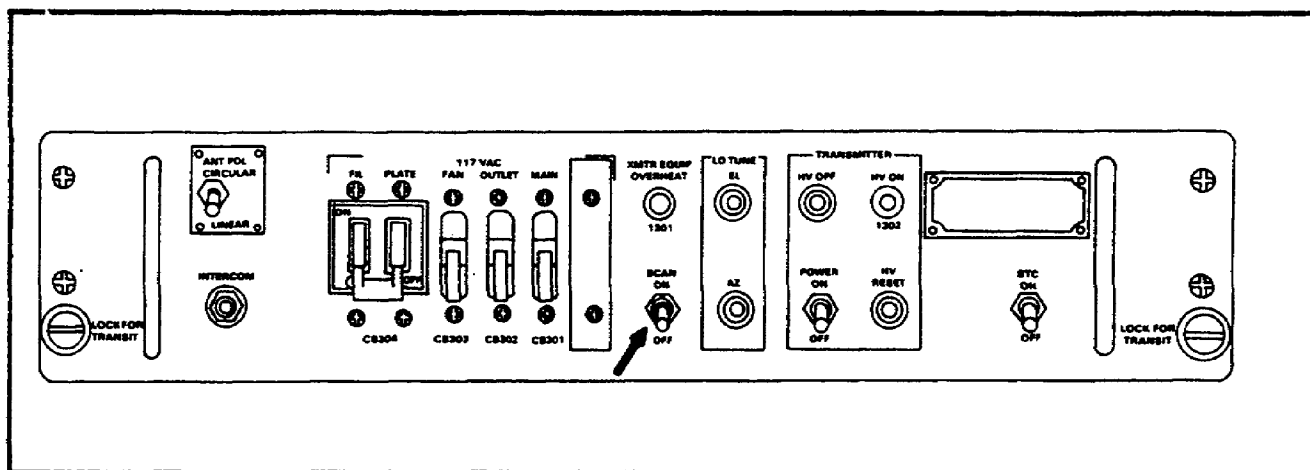


Figure 4. Power distribution panel SB-1116/FPN-40.

d. Locate the following controls on indicator azimuth-elevation range IP-800/FPN-40. (See Figure 5.)

- (1) Radar gain control R-1405.
- (2) IFF gain control R-1406.
- (3) Intensity control R-2404.
- (4) Focus control R-2401.

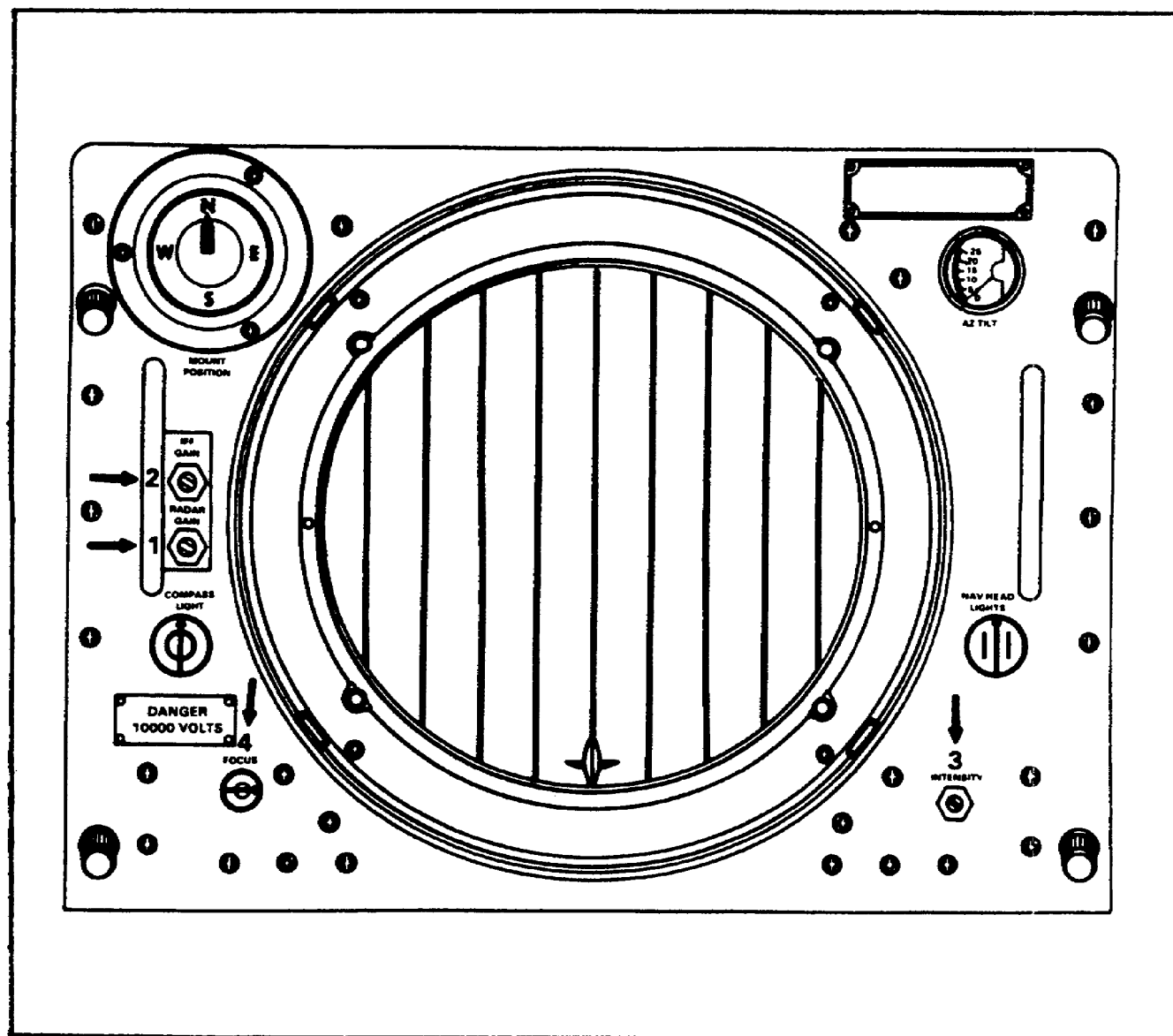


Figure 5. Indicator azimuth-elevation range IP-800/FPN-40.

e. Locate surveillance final approach height FINDER switch S-2802 on control, radar C-2074/FPN-33. (See Figure 6.)

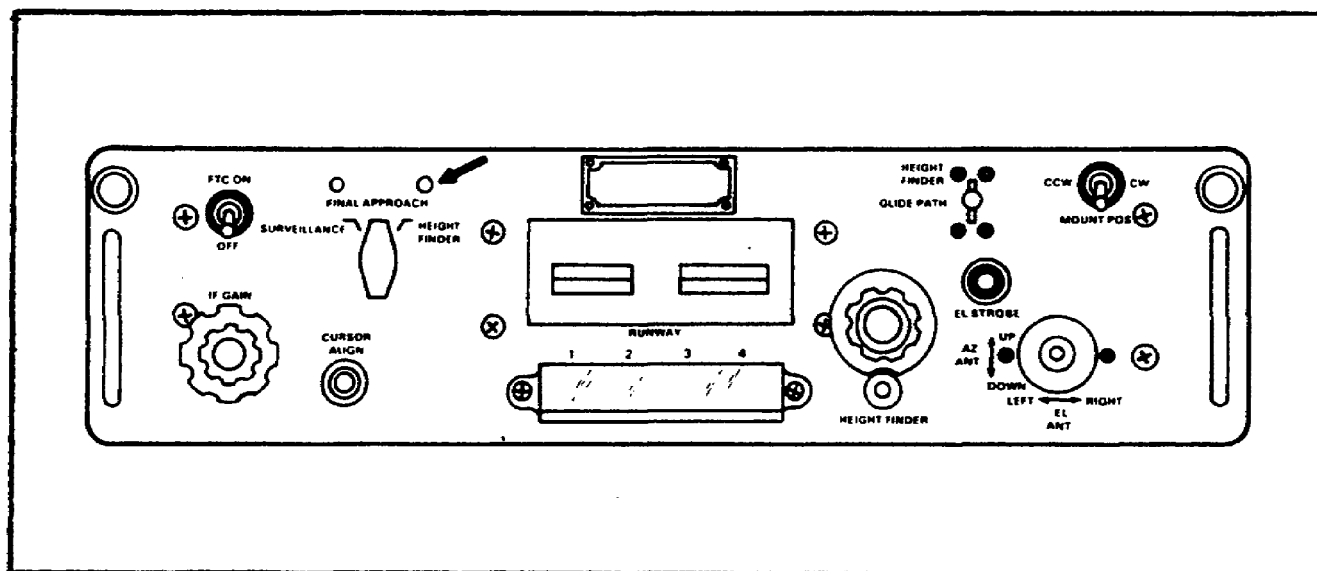


Figure 6. Control, radar C-2074/FPN-33.

f. Locate range mark gain control R1512 and release latches on the synchronizer-generator, electronic-marker SN-386/FPN-40. (See Figure 7.)

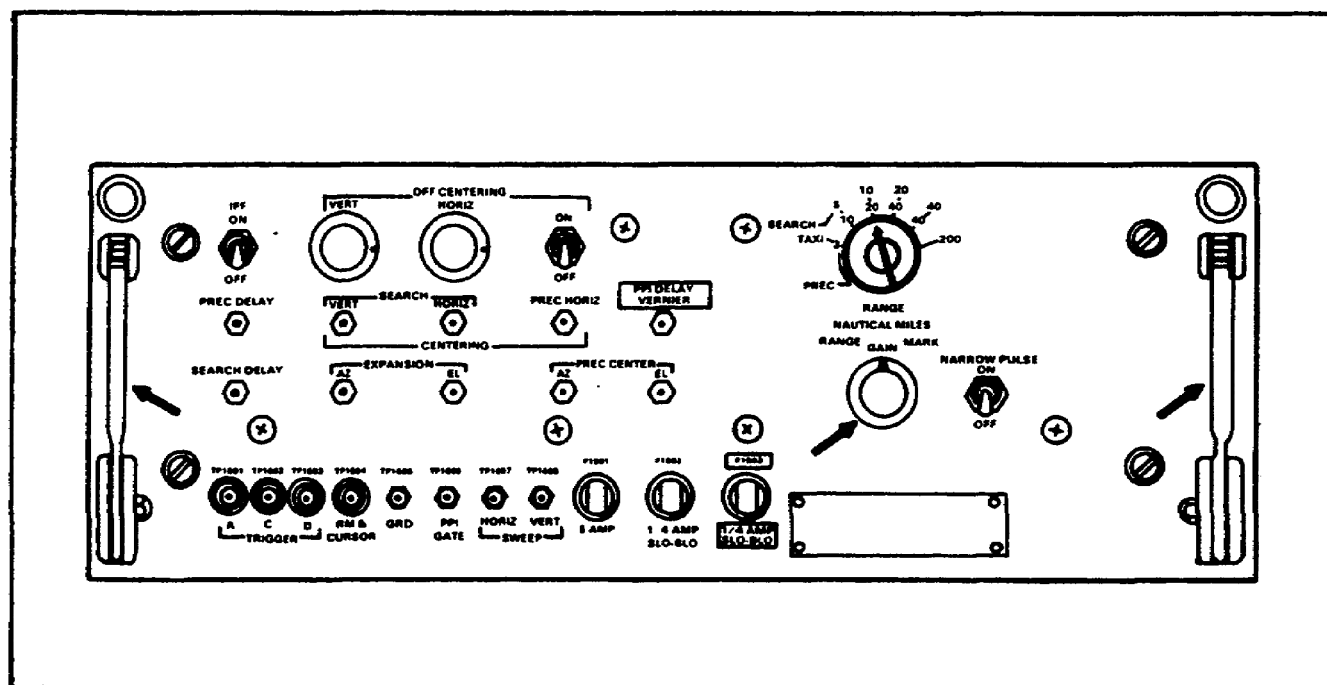


Figure 7. Synchronizer-generator, electronic-marker SN-386/FPN-40.

g. Disengage the release handles (18). Pull the drawer (19) forward and locate the INTERLOCK switch S102 (20). Pull the INTERLOCK switch forward. (See Figure 8.)

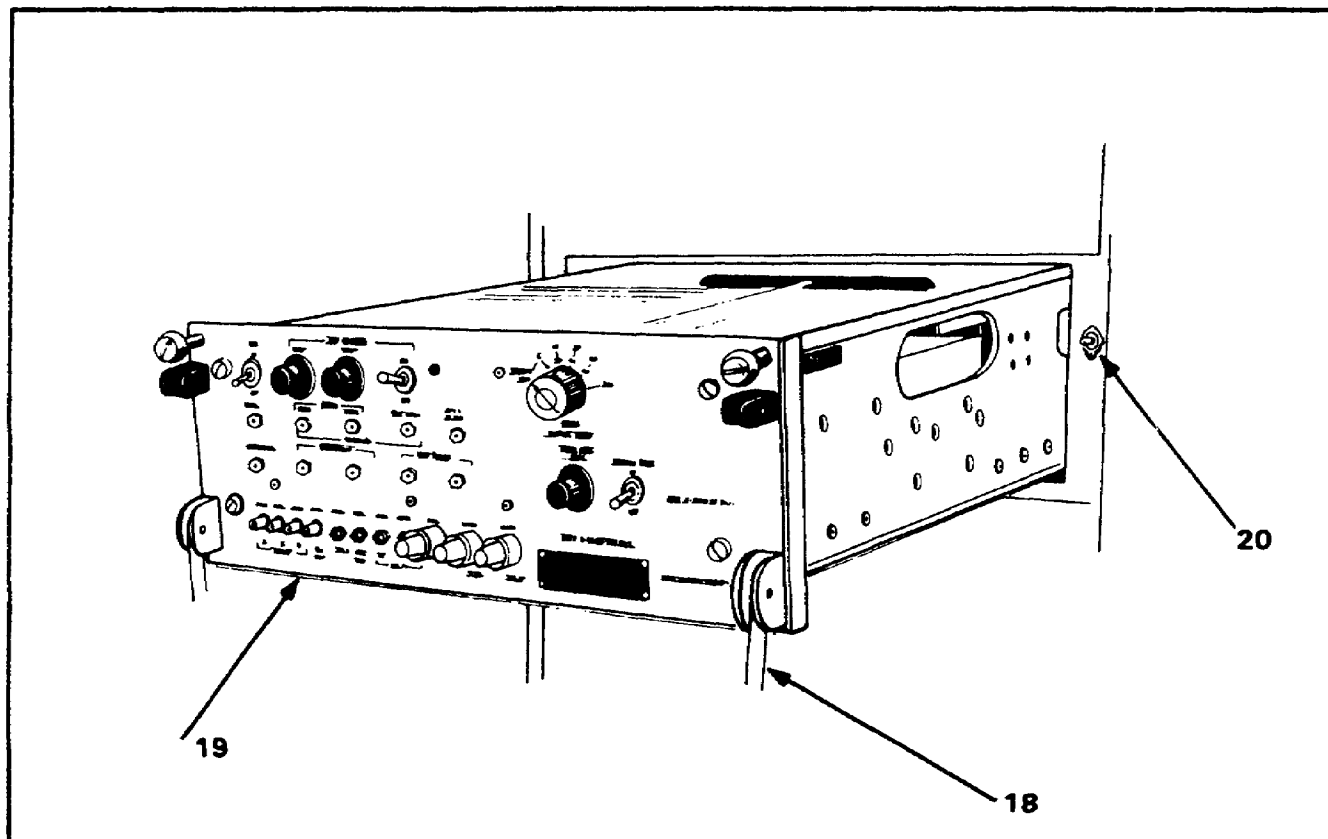


Figure 8. Synchronizer-generator, electronic-marker
SN-386/FPN-40.

NOTES: The INTERLOCK switch must be pulled forward to restore power to the synchronizer-generator chassis SN-386/FPN-40.

An INTERLOCK serves as an off-on switch. Because of its design, the INTERLOCK provides additional functions: First, it removes the power from the unit when the operator opens a panel or drawer. This provides safety for the operator. Secondly, when testing is required by the repairer, it restores power to the unit when placed in its most forward position.

QUESTION: The release handles enables you to _____

QUESTION: What must you do to restore power to the drawer when the drawer is pulled out?

ANSWER: _____

h. Locate the following components of the synchronizer-generator, electronic-marker SN-386/FPN-40. (See Figure 9.)

- (1) Radar and IFF sine-cosine converters MG-1501 and MG-1502.
- (2) 90 V AC test point TP-1520.
- (3) 90 V AC ADJ control R-1598.
- (4) Ground test point TP-1514.

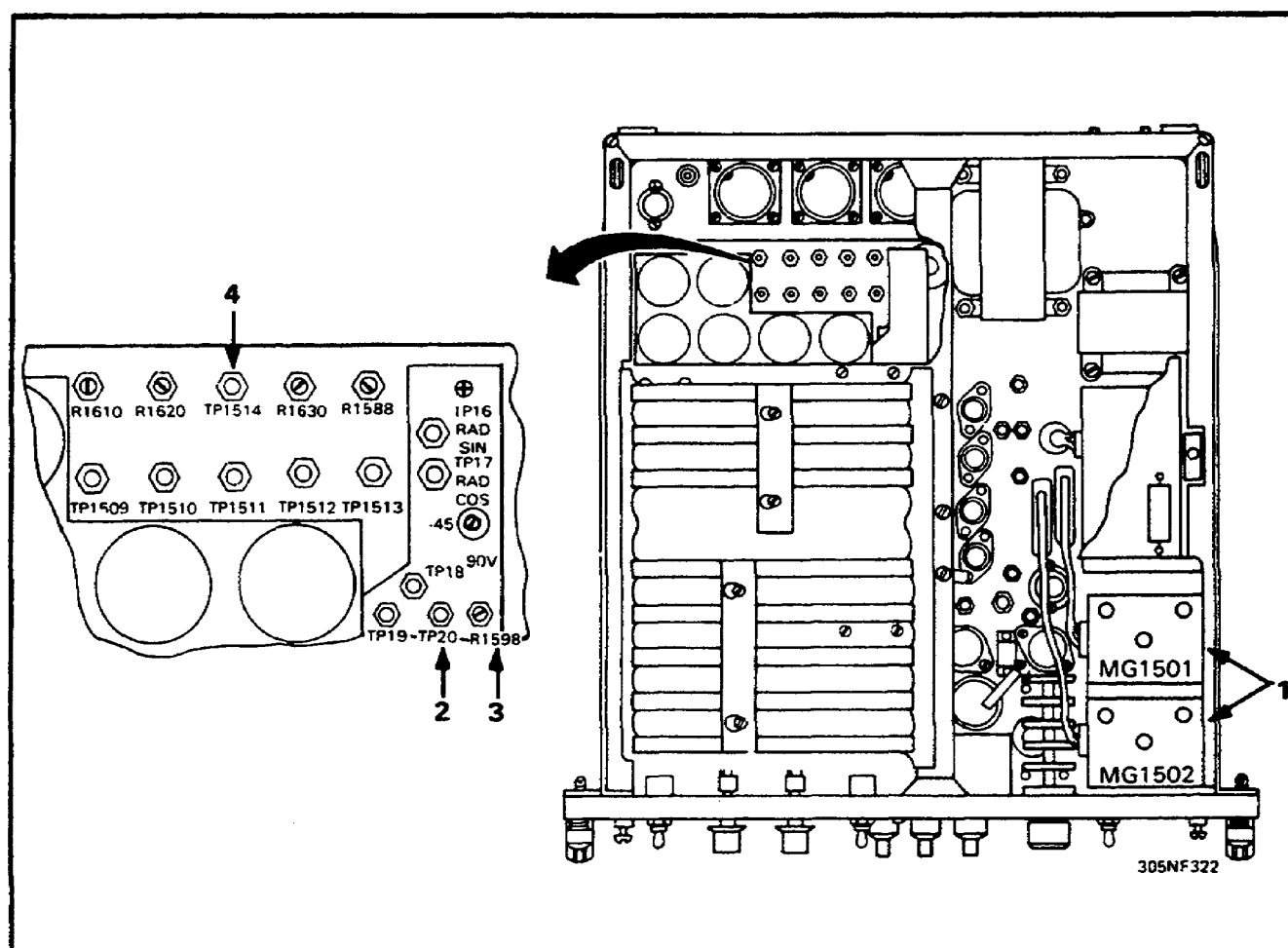


Figure 9. Components of synchronizer-generator, electronic-marker, SN-386/FPN-40.

i. Locate the following controls on the sine-cosine converters MG-1501 and MG-1502. Both are identical. (See Figure 10.)

- (1) Sin gain control.
- (2) Cos gain control.
- (3) Radar IFF select switch.

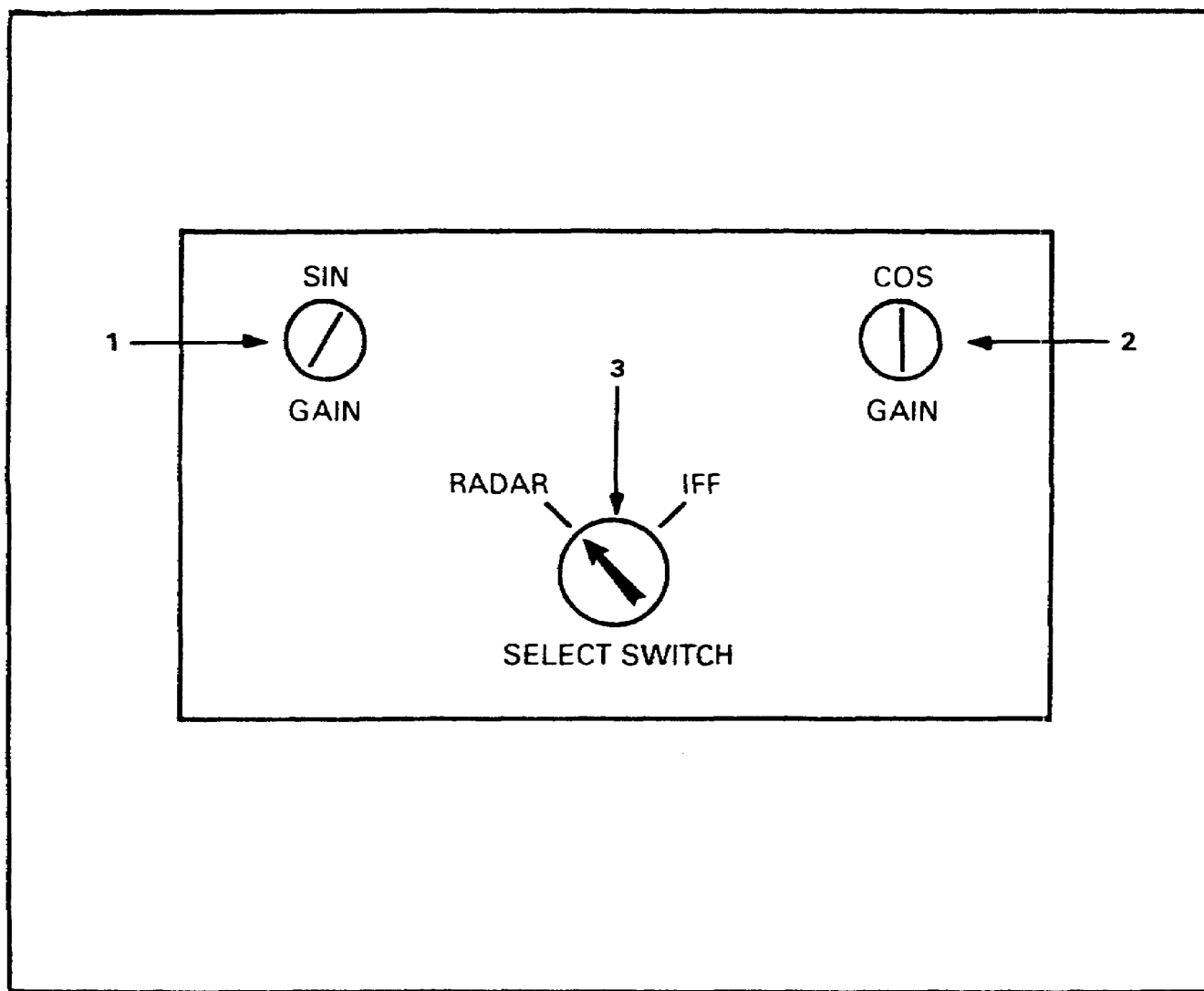


Figure 10. Sine-cosine converter MG-1501 or MG-1502.

3. Align the sine-cosine converters in synchronizer-generator, electronic-marker SN-386/FPN-40.

a. Ensure SCAN switch is in the OFF position and surveillance-final approach-height FINDER switch is in the surveillance position. (See Figures 4 and 6.)

b. Rotate radar gain control R-1405 and IFF gain control R-1406 fully counterclockwise (ccw). (See Figure 11.)

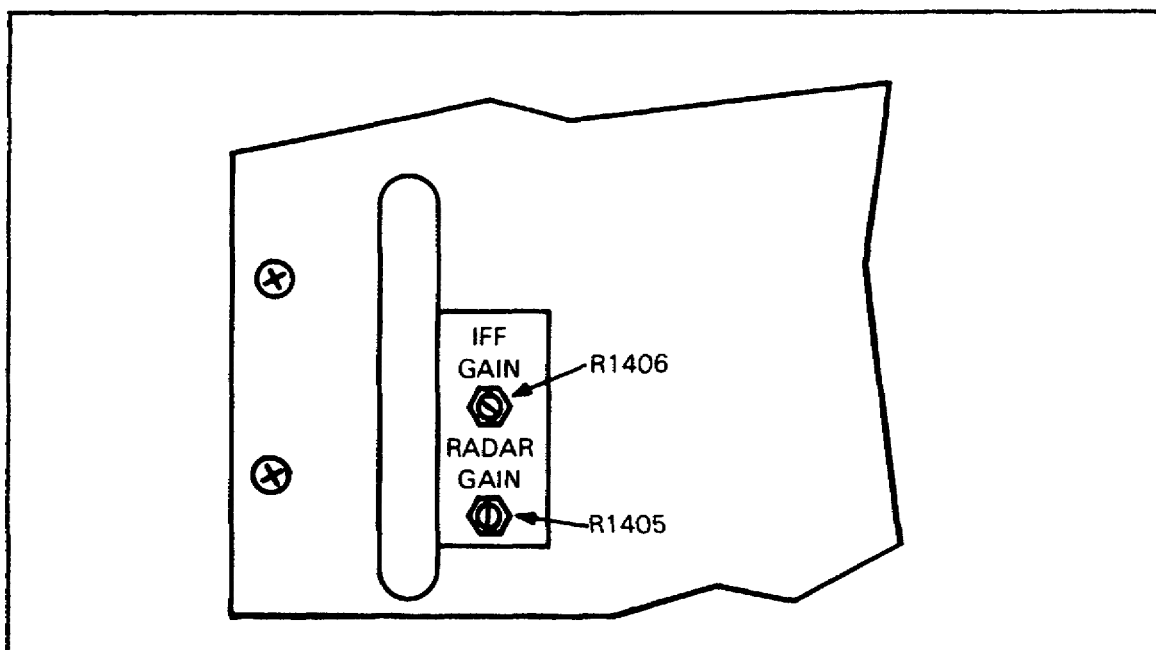


Figure 11. Radar and IFF gain controls.

c. Rotate intensity control R-2404, clockwise (cw) until sweep is visible on the cathode ray tube (CRT). (See Figure 12.)

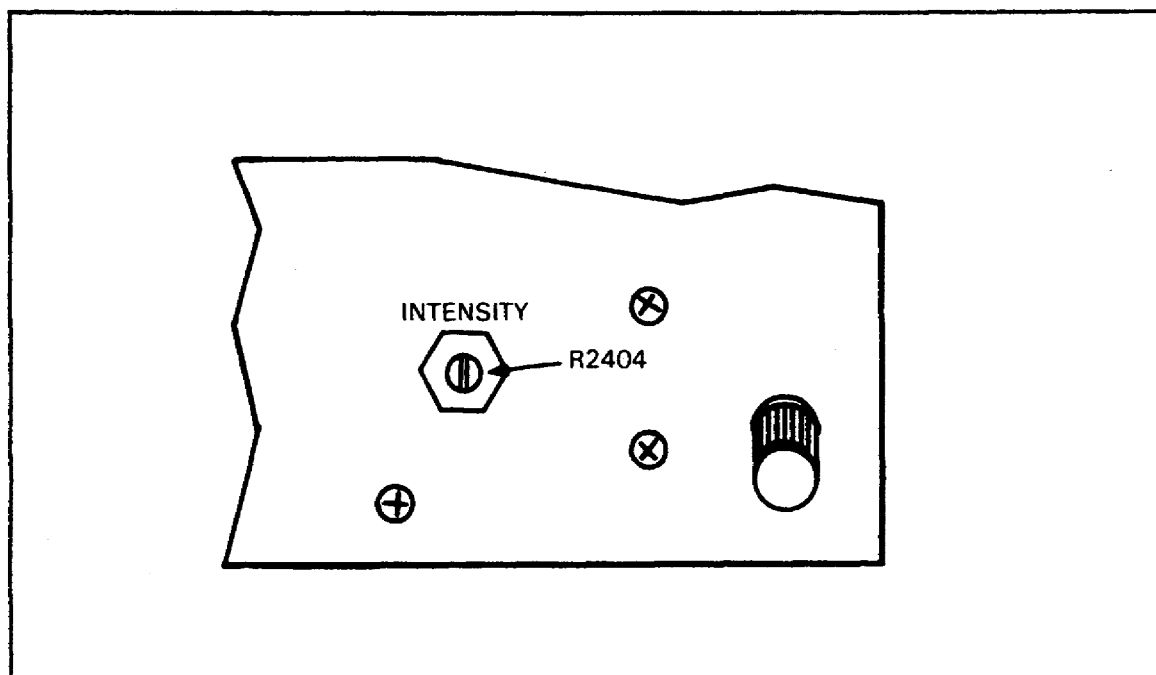
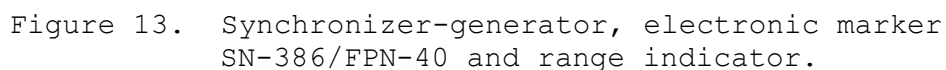


Figure 12. Intensity control.



e. Place radar-IFF switch on radar sine-cosine converter MG-1501 to radar and place the radar-IFF switch on the IFF sine-cosine converter MG-1502 to IFF. (See Figure 14.)

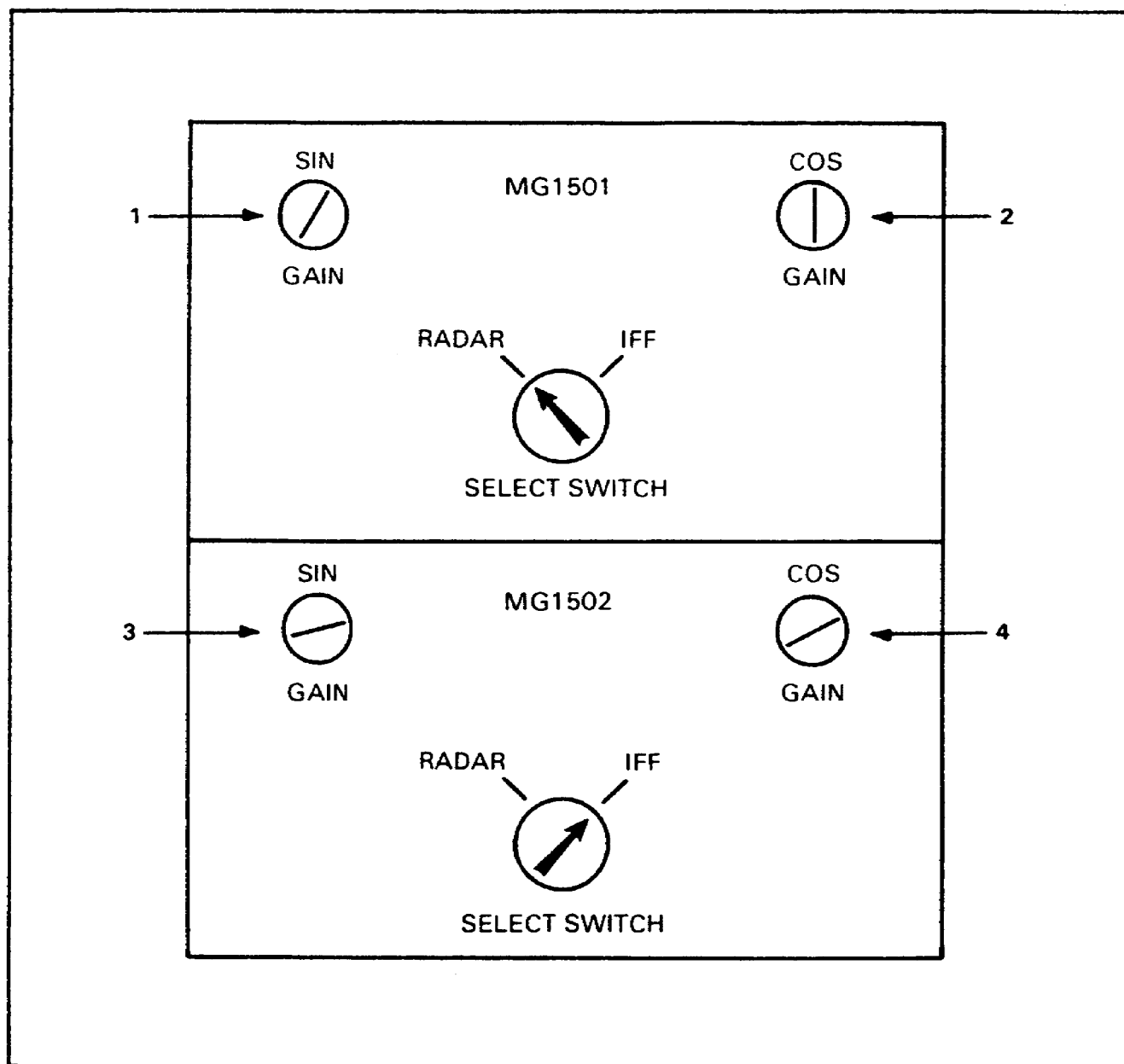


Figure 14. Sine-cosine converters.

f. Measure the AC line voltage at the AC convenience outlets and record the voltage value. (See Figure 3.)
_____ V AC.

g. Multiply the AC line voltage obtained in step f by 0.769 and record the results. _____

Example: 115 V AC (line voltage)
 x .769
 ———
 1035
 690
 805
 ———
 88.435

h. Connect multimeter between the 90 V AC test point TP-1520 and the ground test point TP-1514. Adjust the 90 V AC adjustment control R-1598 for a meter indication of the voltage value obtained in step g. (See Figure 15.)

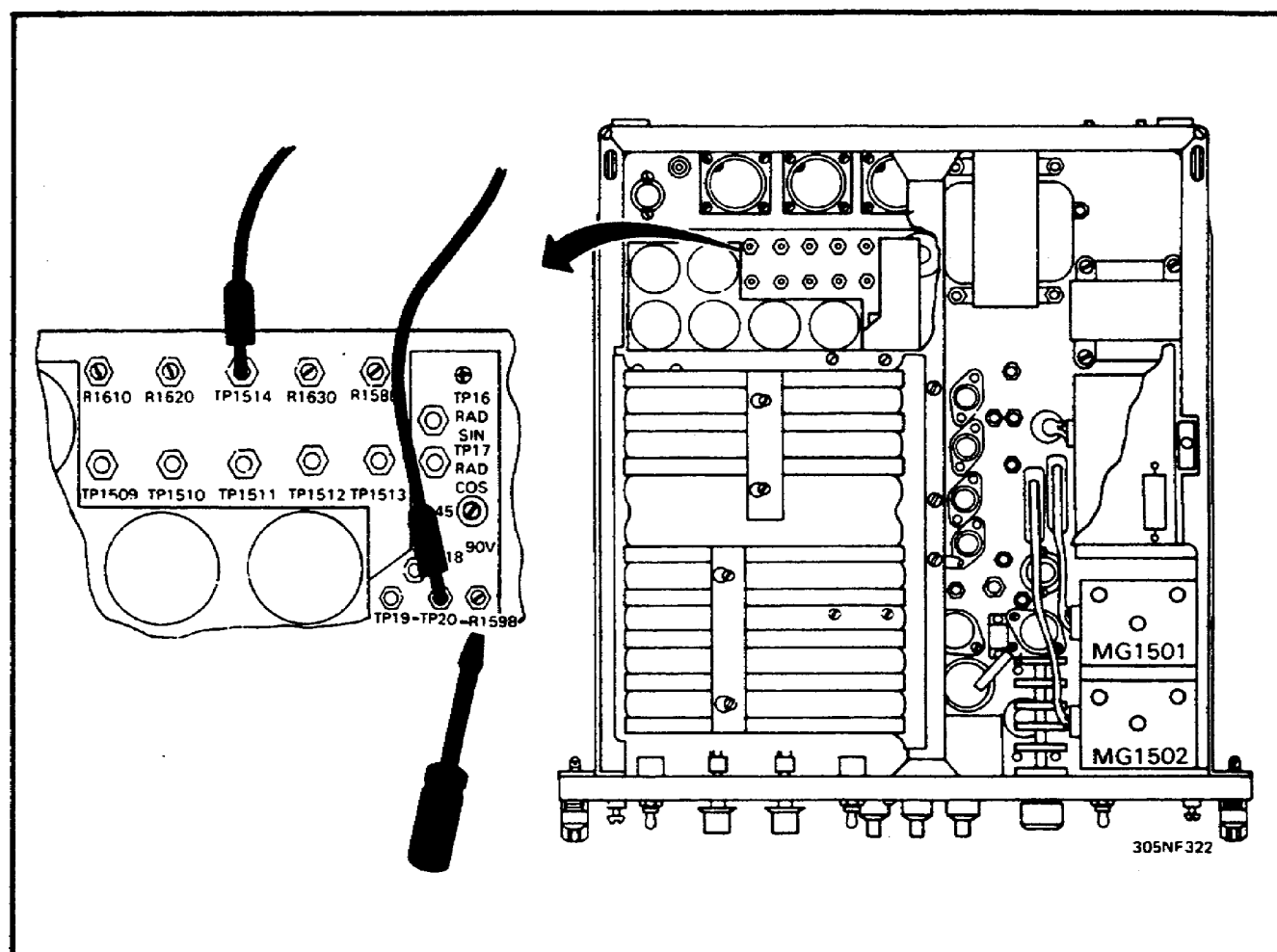


Figure 15. 90 V AC adjustment control R-1598.

i. Connect multimeter between the rad sin test point TP-1516 and ground test point TP-1514. (See Figure 16.)

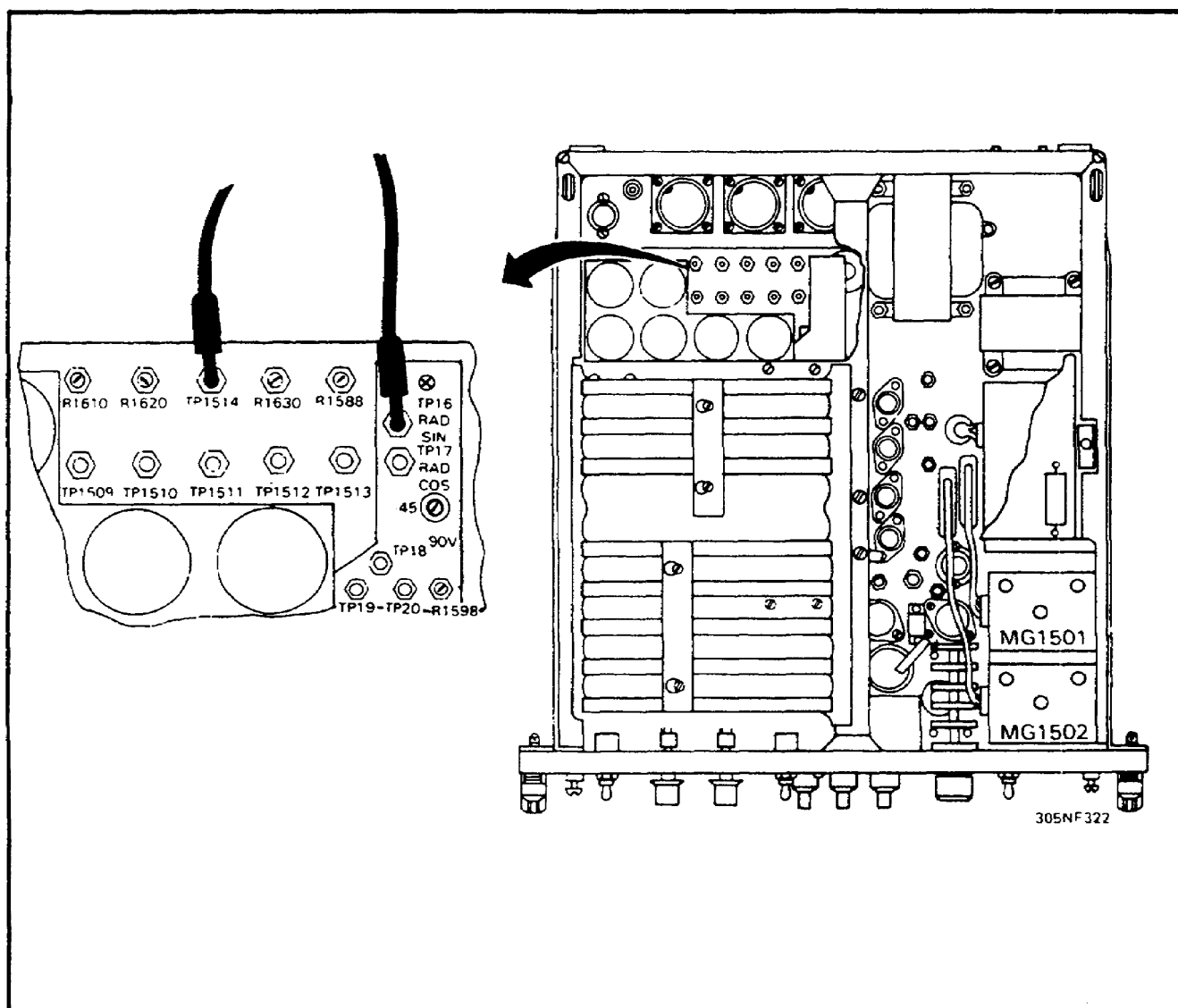


Figure 16. Radar sine test connection.

NOTE: Steps j and k will indicate either a positive or negative (\pm) DC voltage.

j. Have assistant rotate azimuth antenna by hand until a maximum voltage is indicated on the multimeter. Adjust the sine gain control on the radar sine-cosine converter MG-1501 for ± 36 V DC. (See Figure 17.) Record reading _____.

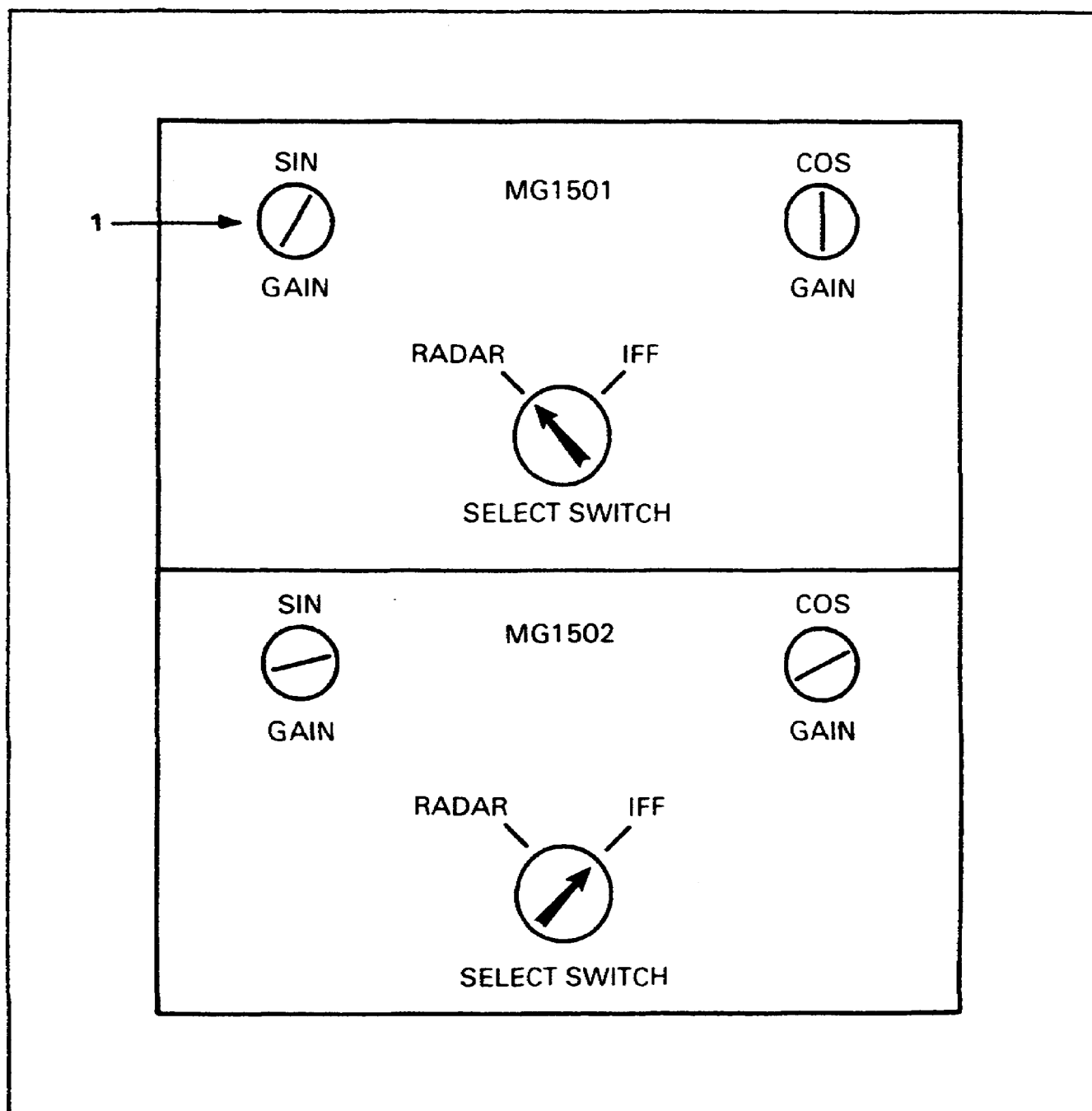


Figure 17. Sine gain control.

k. Connect the multimeter between the radar cos test point TP-1517 and ground test point TP-1514. (See Figure 18.)

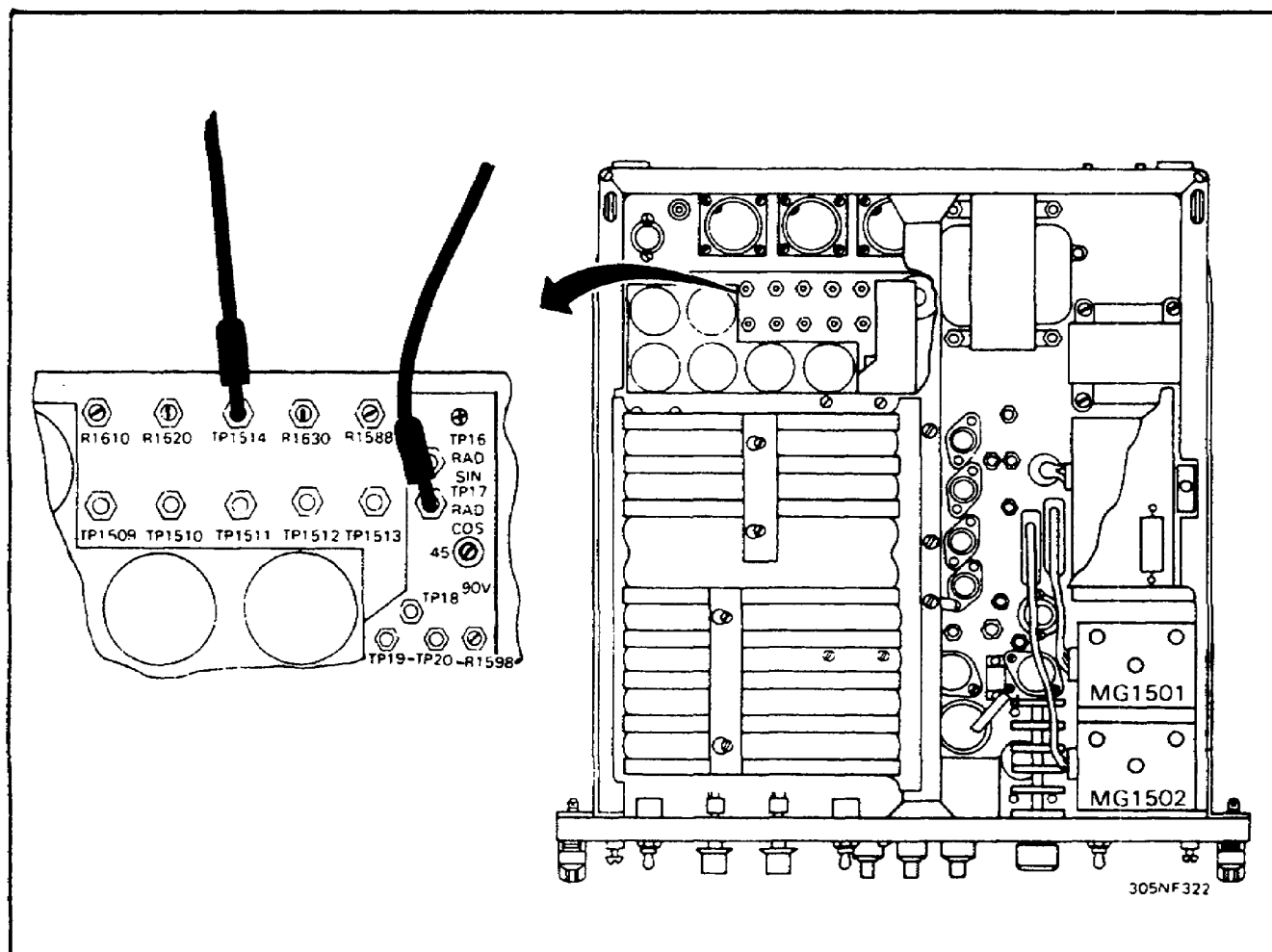


Figure 18. Radar cosine test connection.

l. Have your assistant rotate the azimuth antenna until you have a maximum voltage indication on the multimeter. Adjust the cos gain control on the radar sine-cosine converter MG-1501 for a ± 36 volts DC. (See Figure 19.) Record reading _____.

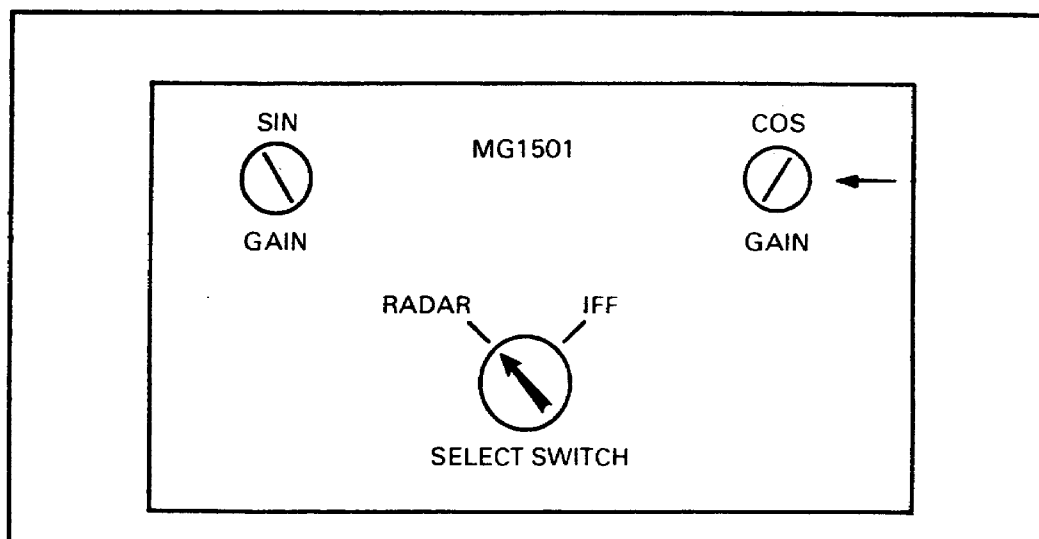


Figure 19. Adjustment of cosine gain control on MG-1501.

m. Connect the multimeter to IFF sin test point TP-1515 and observe the voltage indication. (See Figure 20.)

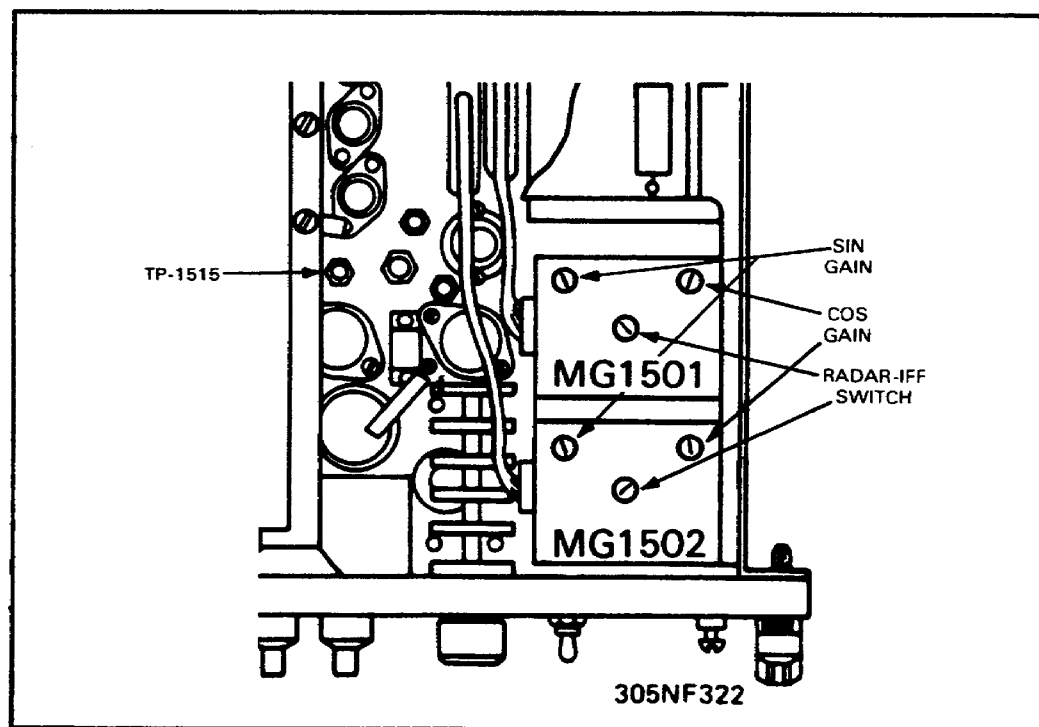


Figure 20. Connection of multimeter to TP-1515.

n. Have your assistant rotate the IFF antenna for a maximum voltage indication on the multimeter. Adjust IFF sine gain control on the IFF sine-cosine converter MG-1502 for ± 36 V DC. (See Figure 21.) Record reading _____.

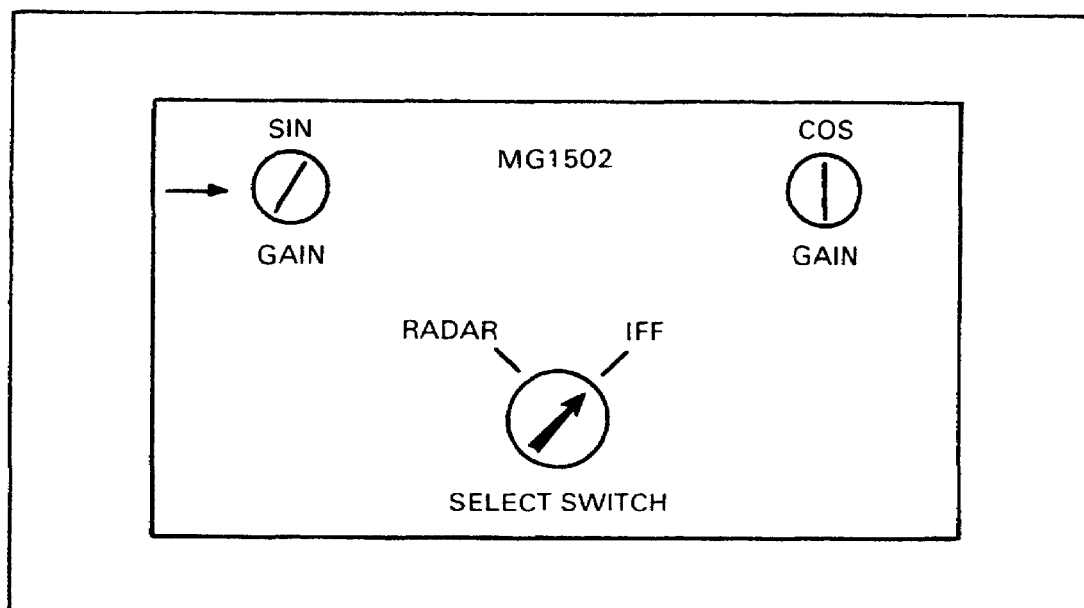


Figure 21. IFF sine gain control adjustment.

o. Connect the multimeter to IFF cos test point TP-1521 and observe the voltage. (See Figure 22.)

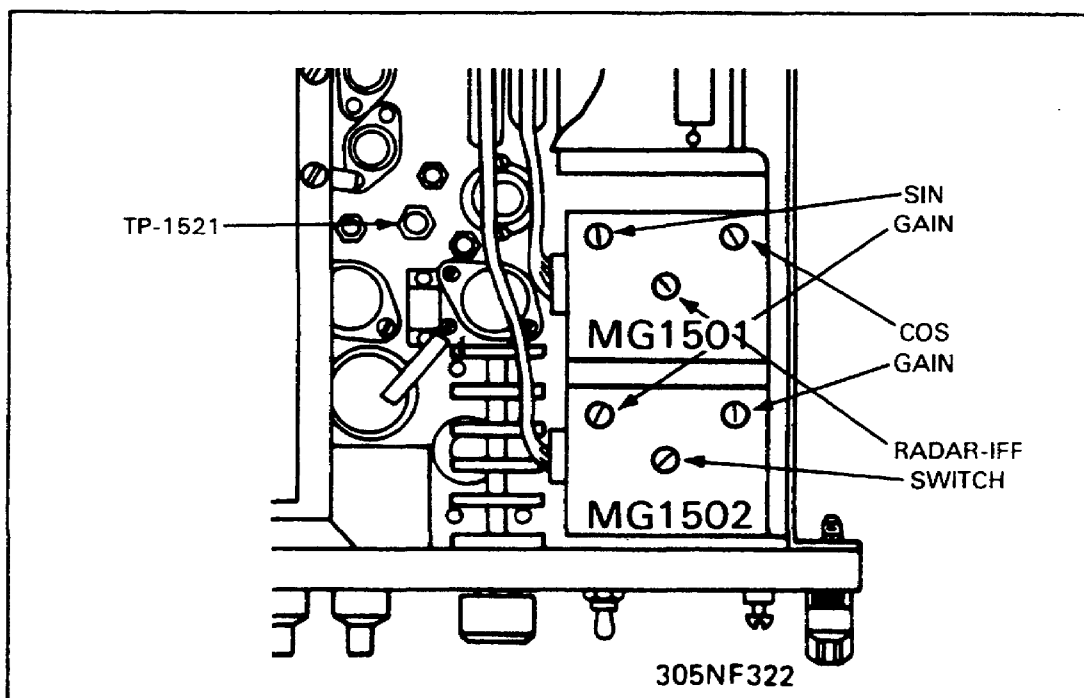


Figure 22. Connection of multimeter to TP-1521.

p. Have your assistant rotate the IFF antenna for a maximum voltage indication on the meter. Adjust cos gain control on IFF sine-cosine converter MG-1502 for a ± 36 V DC. (See Figure 23.) Record reading _____.

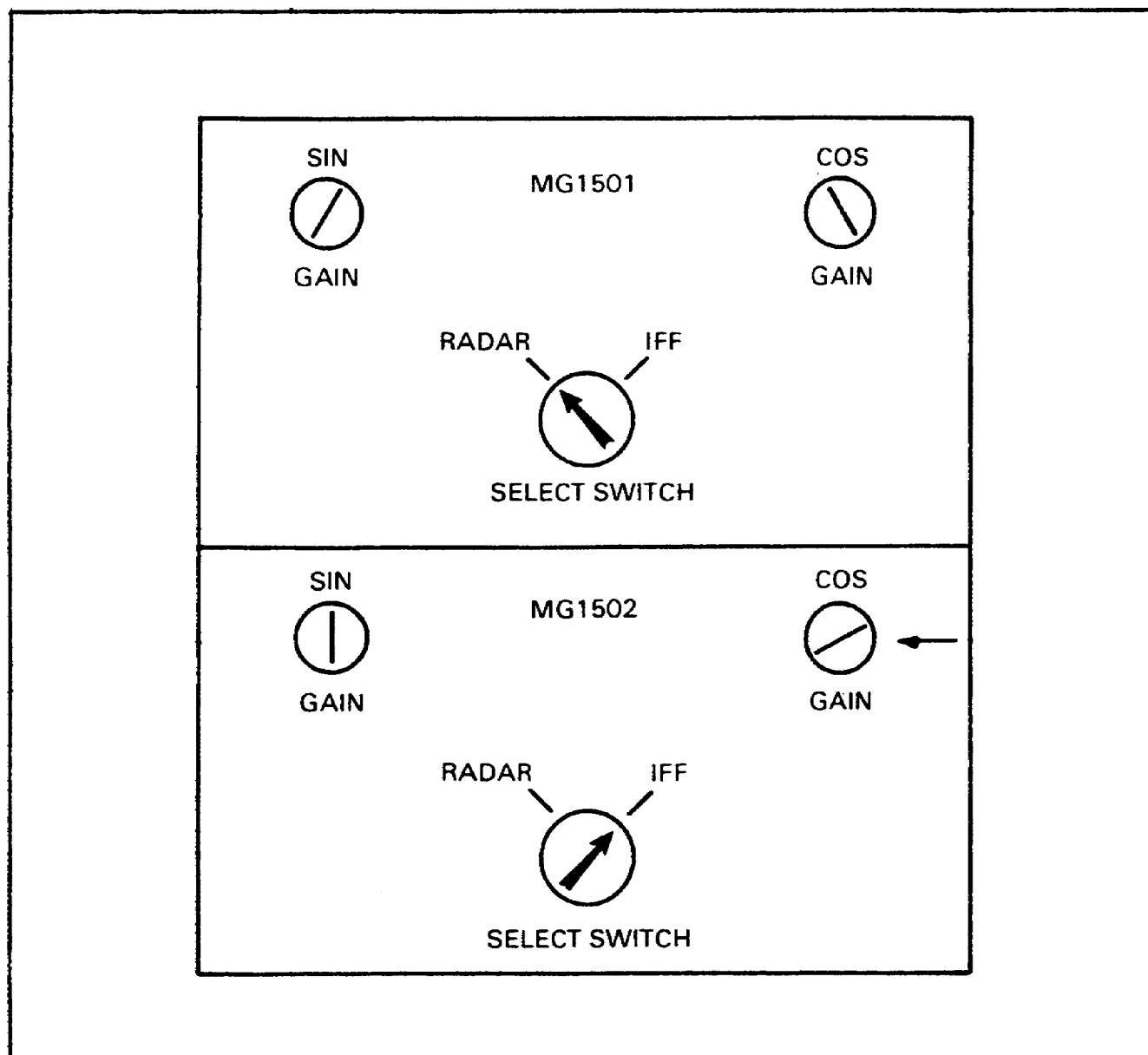


Figure 23. Adjustment of cosine gain control on MG-1502.

4. Using this checklist, review the location of the following components and control. (Place a check beside each component or control as you locate them in the previous figures.

- _____ IFF gain control (Figure 11)
- _____ Radar gain control (Figure 11)
- _____ FOCUS control (Figure 5)
- _____ Synchronizer-generator, electronic-marker SN-386/FPN-40 (Figure 7)
- _____ Release latches for various drawers (Figure 7)
- _____ Range mark gain control R-1512 (Figure 7)
- _____ Chassis interlock switch S-102 (Figure 8)
- _____ Radar sine-cosine converter MG-1501 (Figure 9)
- _____ IFF sine-cosine converter MG-1502 (Figure 9)
- _____ 90 V AC test point TP-1520 (Figure 9)
- _____ 90 V AC adjust control R-1598 (Figure 9)
- _____ Ground test point TP-1514 (Figure 9)
- _____ Sin gain control (Figure 10)
- _____ Cos gain control (Figure 10)
- _____ Radar-IFF select switch (Figure 10)
- _____ AC convenience outlets (Figure 3)

Learning Event 2:
ALIGN THE AN/FPN-40 ELEVATION SERVO STROBE

1. Learning Event 2 will enable you to perform the following:
 - a. Learn the function and use of controls.
 - b. Align the elevation servo strobe.
2. Location and initial settings of components and controls.
 - a. Locate the control indicator group OA-2664/FPN-40 on radar set AN/FPN-40. (See Figure 24.)

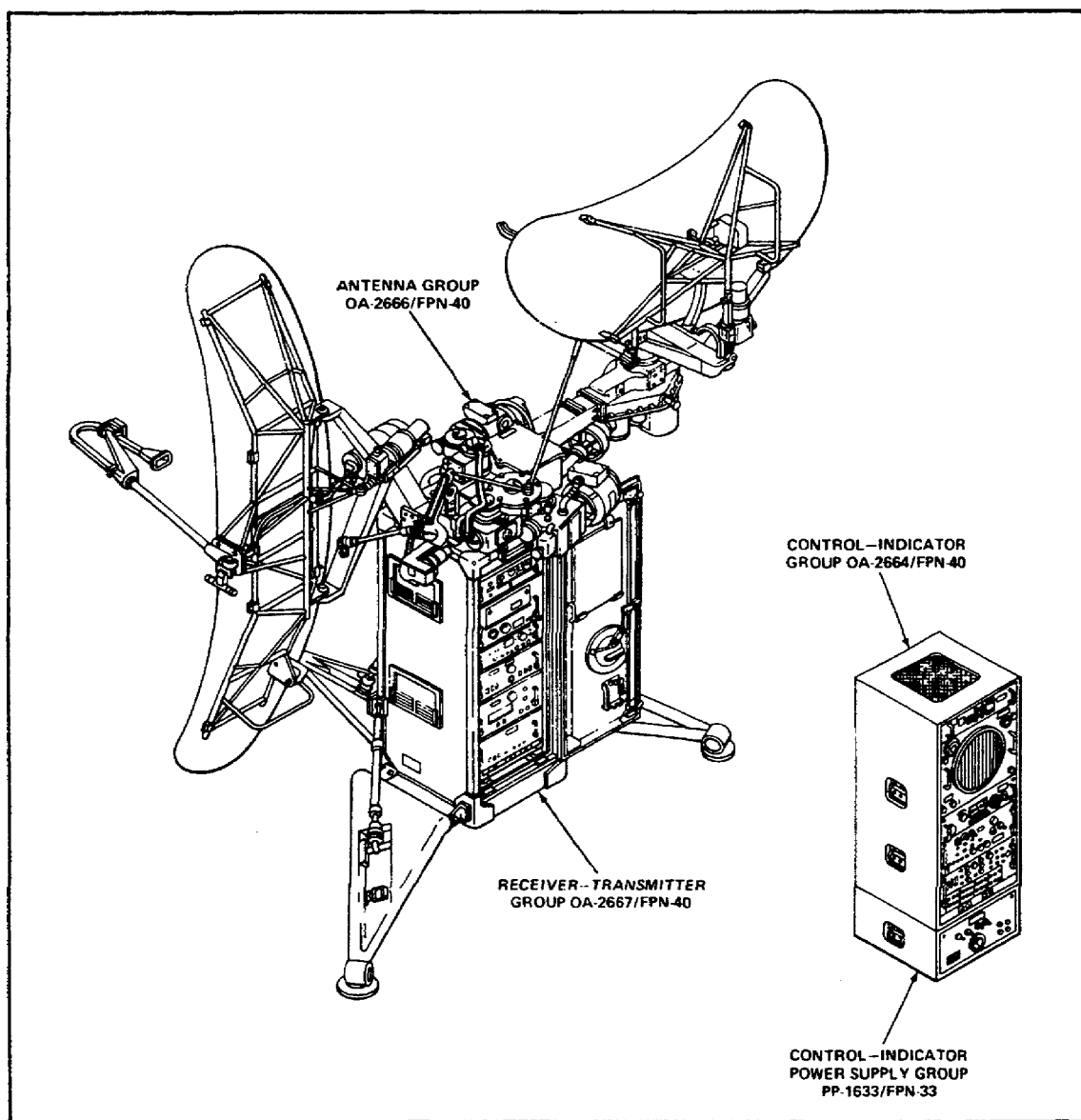


Figure 24. Radar set AN/FPN-40.

b. Locate the following drawers on control indicator group OA-2664/FPN-40. (See Figure 25.)

- (1) Panel, power distribution SB-1116/FPN-40.
- (2) Indicator, azimuth-elevation-range IP-800/FPN-40.
- (3) Control, radar set C-2074/FPN-33.
- (4) Computer, navigational CP-338/FPN-33.

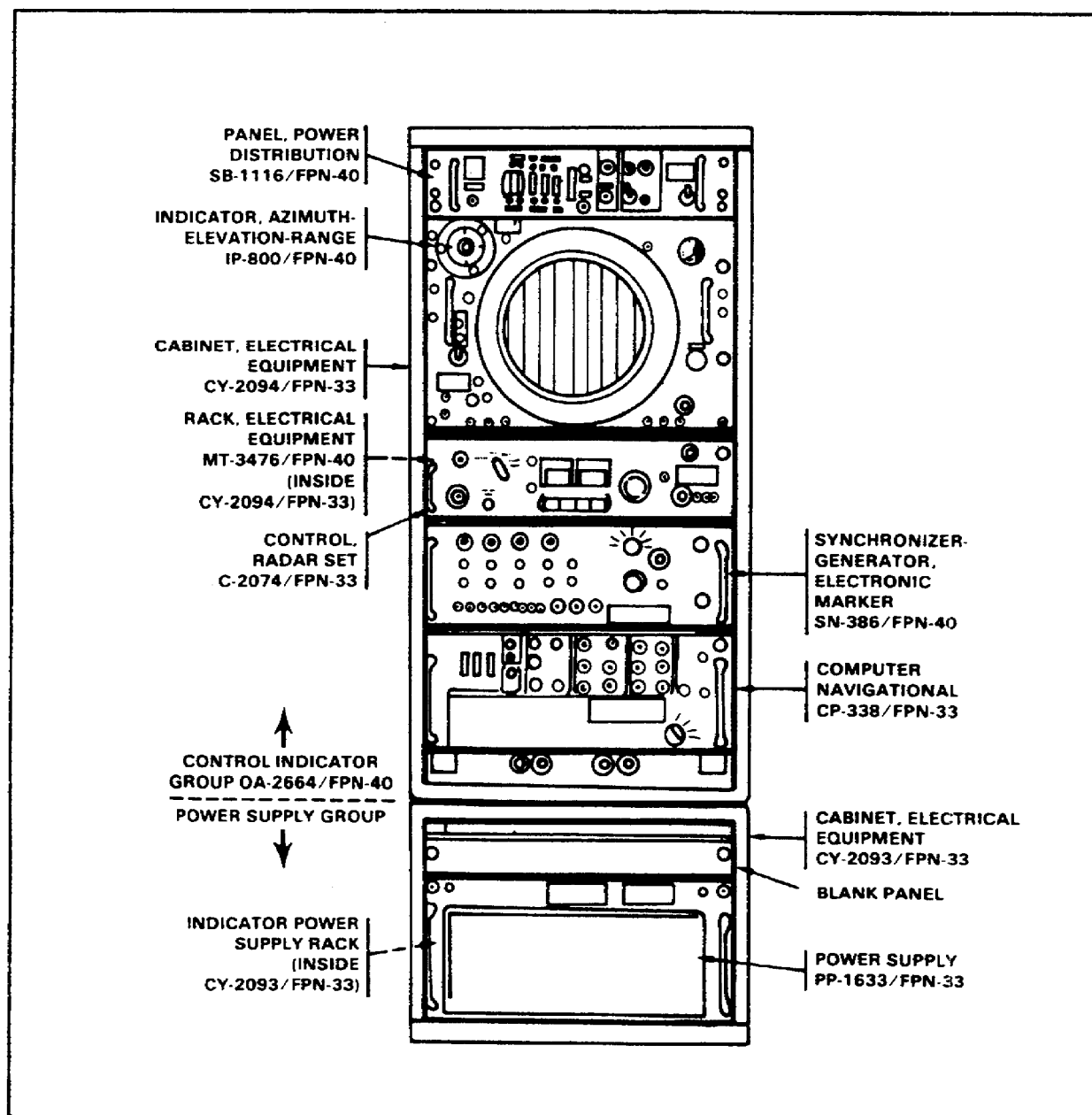


Figure 25. Control indicator group OA-2664/FPN-40.

c. Locate the following on receiver-transmitter group OA-2667/FPN-40:
(See Figure 26.)

- (1) Elevation antenna AS-1080/FPN-40.
- (2) Control monitor C-2124A/FPN-33.

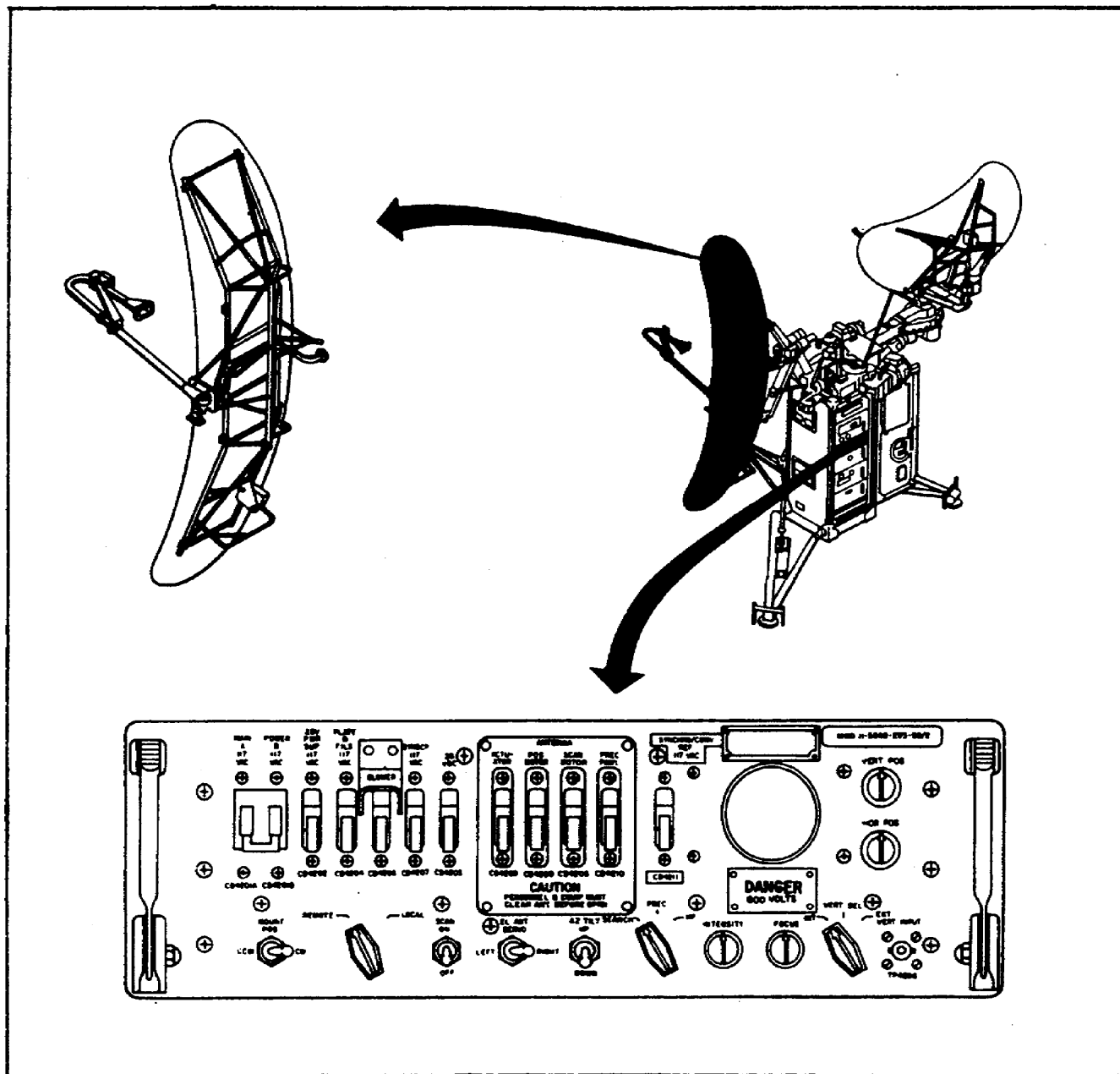


Figure 26. Receiver-transmitter group OA-2667/FPN-40.

d. Locate the elevation servo protractor on the elevation antenna AS-1080/FPN-40. (See Figure 27.)

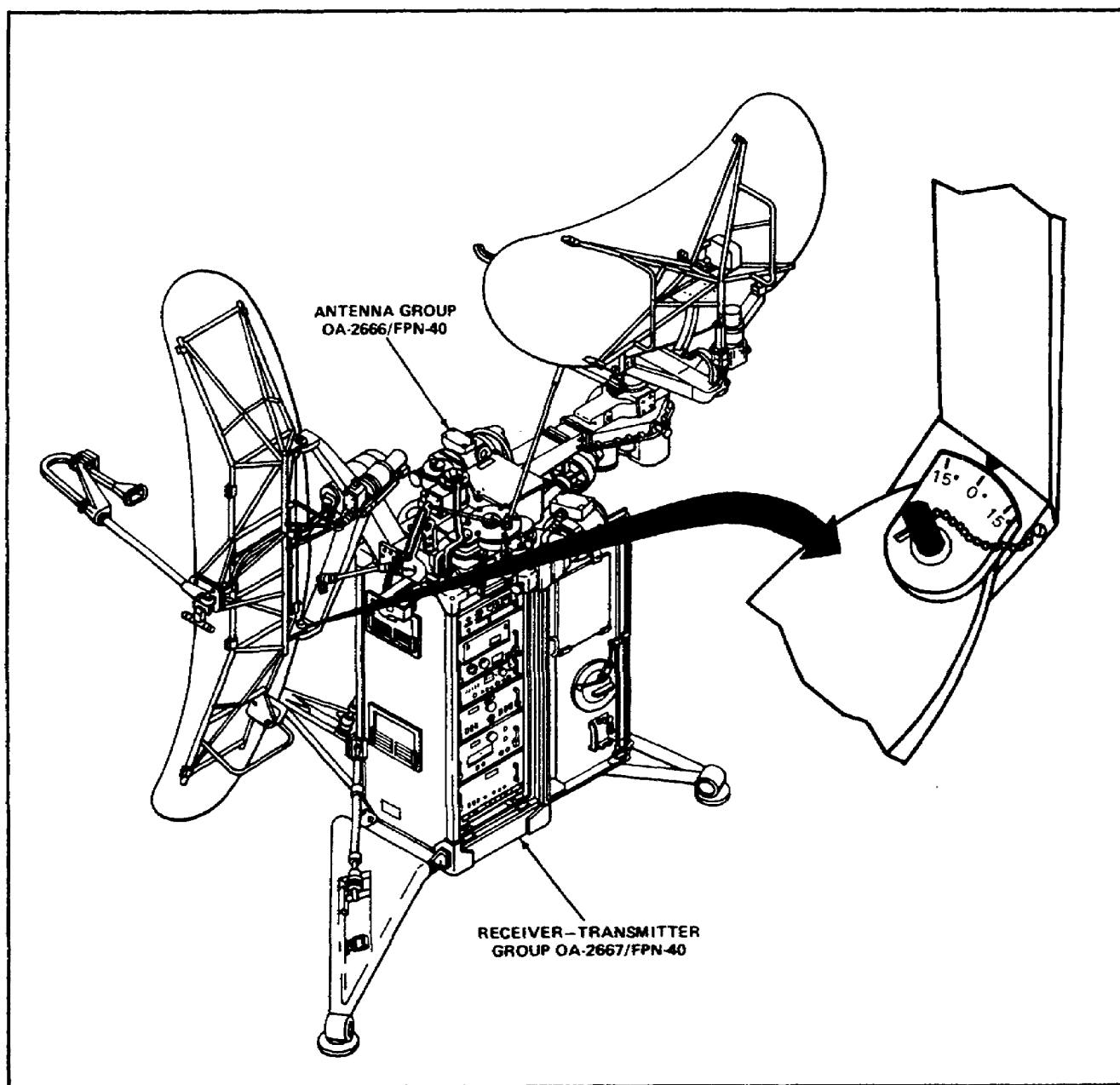


Figure 27. AS-1080/FPN-40.

NOTE: The elevation servo protractor has three "tic" marks on the protractor plate. The center tic mark is the 0° mark. The outer two tic marks are 15° marks. The reference point for the tic marks is a raised point to the right of the protractor plate.

QUESTION: The center "tic" mark on the protractor plate is the _____ mark.

e. Locate the following on control-monitor C-2124A/FPN-33. (See Figure 28.)

- (1) LOCAL-REMOTE switch S4203.
- (2) SCAN switch S4201.
- (3) EL ANT SERVO switch S4205.

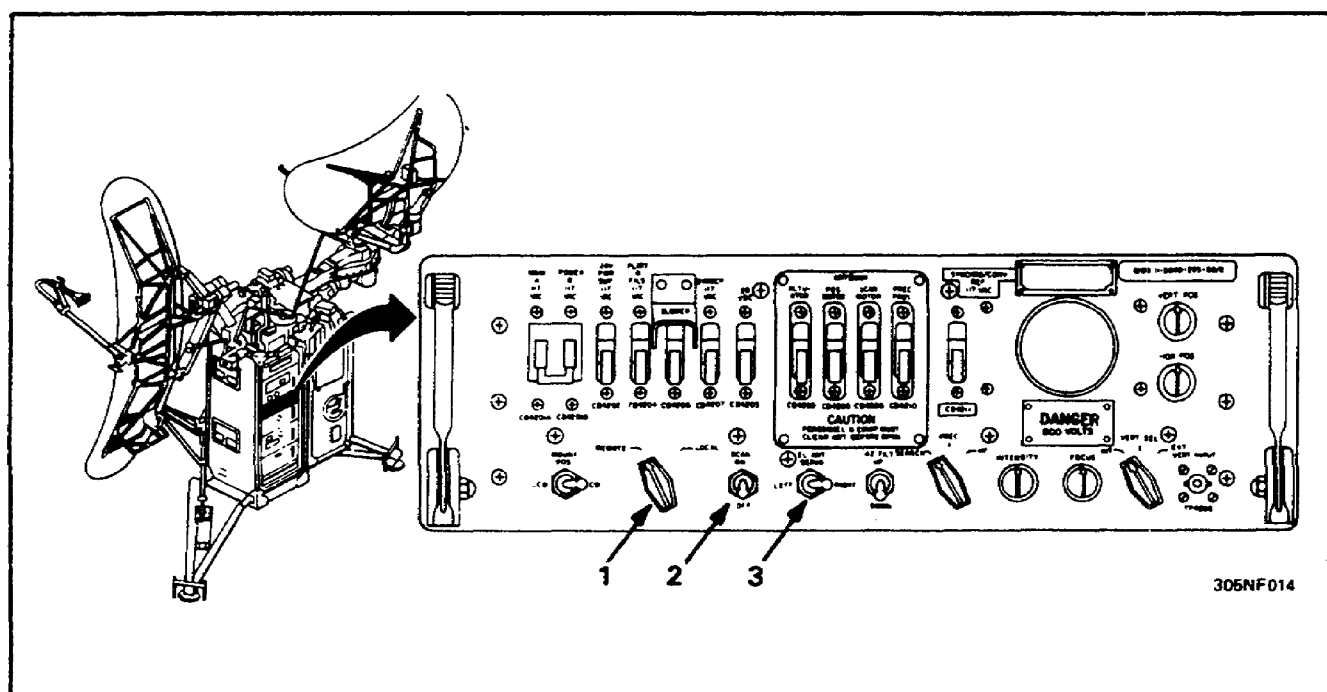


Figure 28. Control monitor C-2124A/FPN-33.

f. Perform the following on control-monitor C-2124A/FPN-33: (See Figure 29.)

- (1) Place LOCAL-REMOTE switch S4203 to LOCAL.
- (2) Place SCAN switch S4201 to OFF.

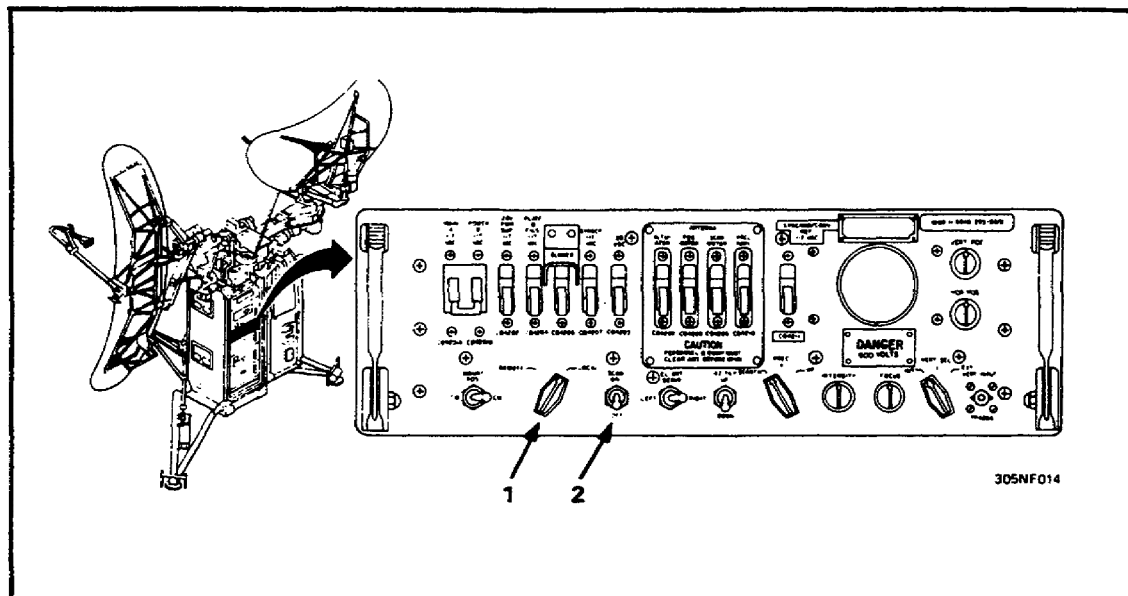


Figure 29. Control monitor C-2124A/FPN-33.

g. Push the EL ANT SERVO switch S4205 left or right to position the elevation antenna AS-1080/FPN-40 to indicate 0° on the elevation servo protractor. (See Figure 30.)

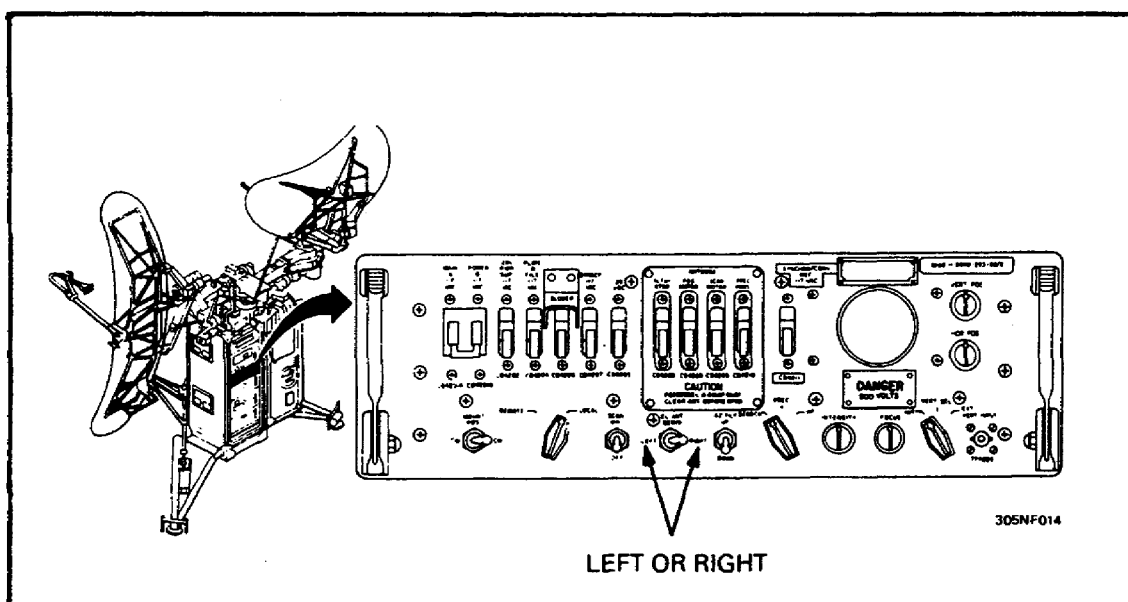


Figure 30. Control monitor C-2124A/FPN-33 and elevation servo.

NOTE: The EL ANT SERVO switch S4205 is a spring loaded switch. When S4205 is pushed to the left or right, it will servo the elevation antenna to the left or right. When S4205 is released, it will automatically return to the center position.

QUESTION: The EL ANT SERVO switch S4205 is a _____ switch. When released it will automatically return to the _____ position.

h. Place the LOCAL-REMOTE switch S4203 on control monitor C-2124A/FPN-33 to REMOTE. (See Figure 31.)

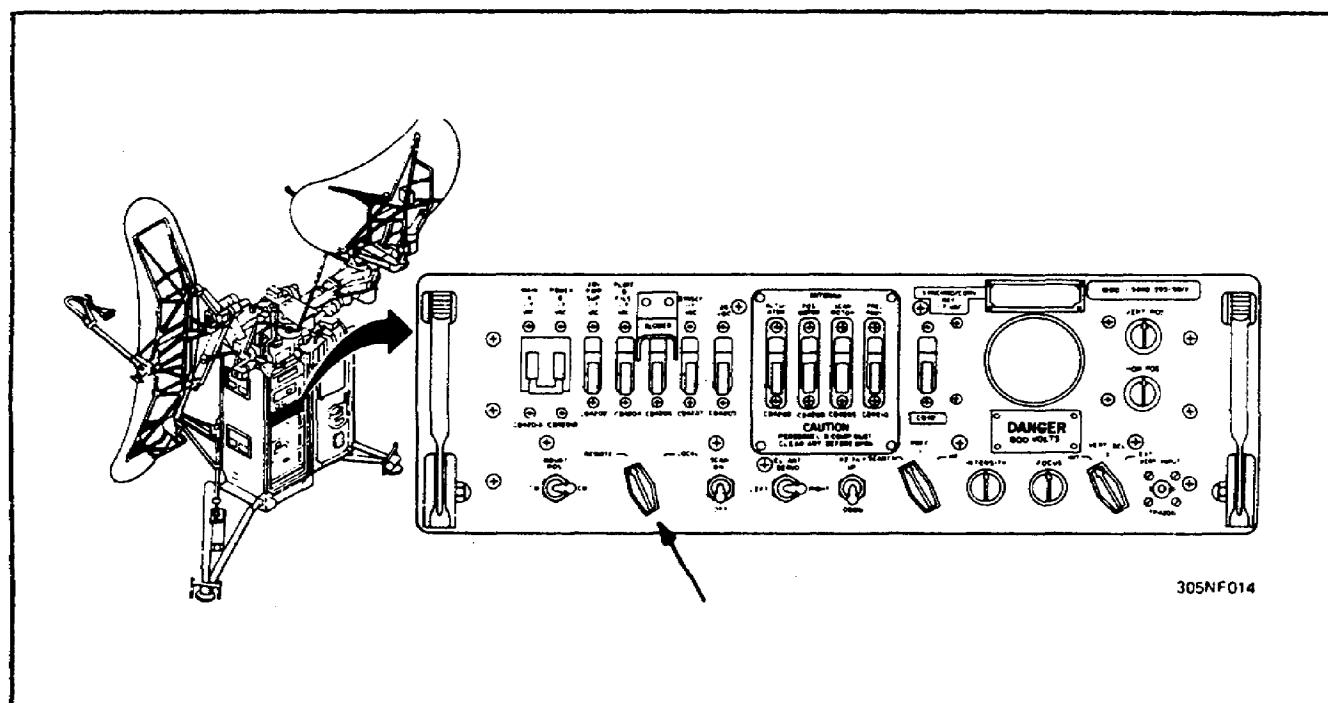


Figure 31. P/O control monitor C-2124A/FPN-33.

i. Locate SCAN switch S305 on panel, power distribution SB-1116/FPN-40 on control indicator group OA-2664/FPN-40. (See Figure 32.)

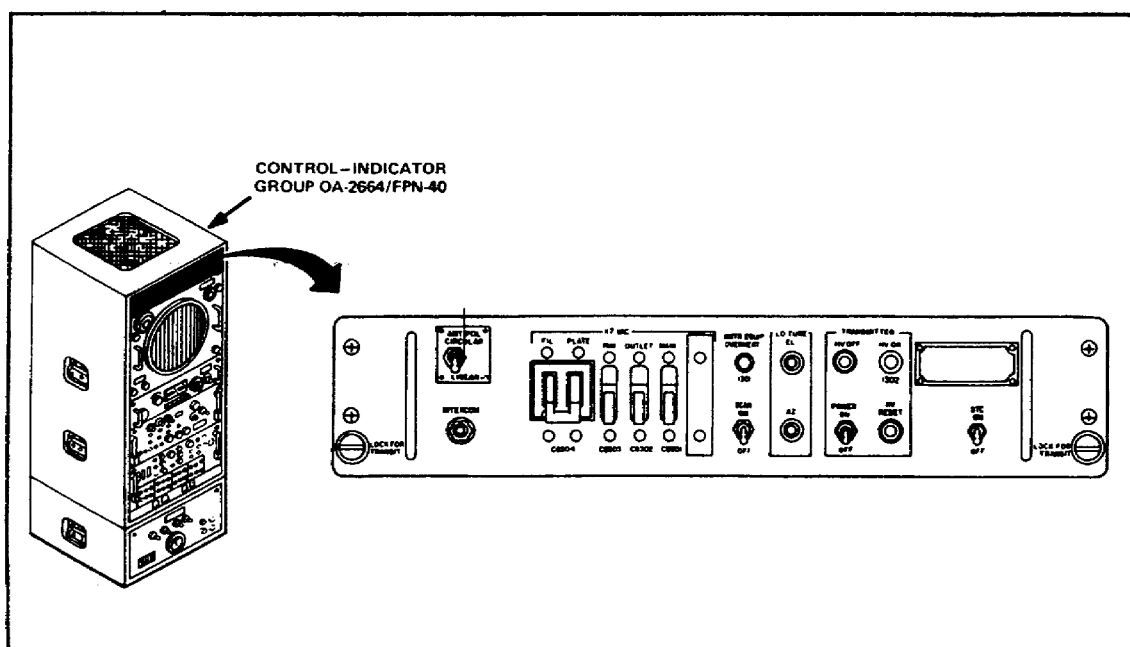


Figure 32. Control-indicator group, panel, power distribution SB-1116/FPN-40.

j. Place SCAN switch S305 to ON. (See Figure 33.)

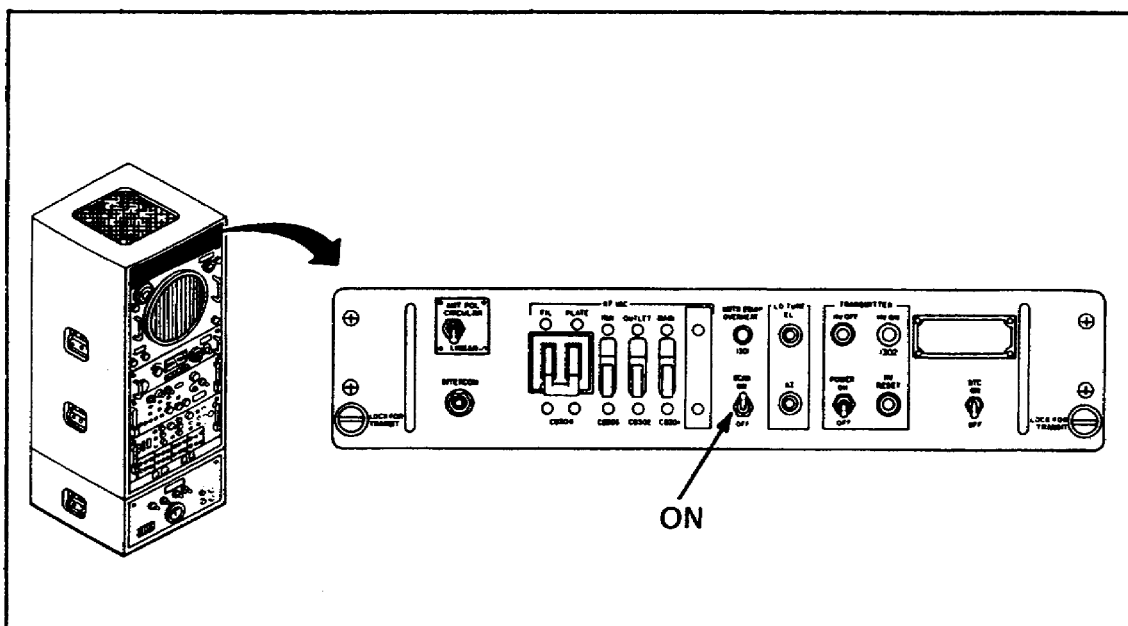


Figure 33. Panel, power distribution SB-1116/FPN-40.

k. Locate the INTENSITY control R-2404 on indicator, azimuth-elevation-range IP-800/FPN-40. (See Figure 34.)

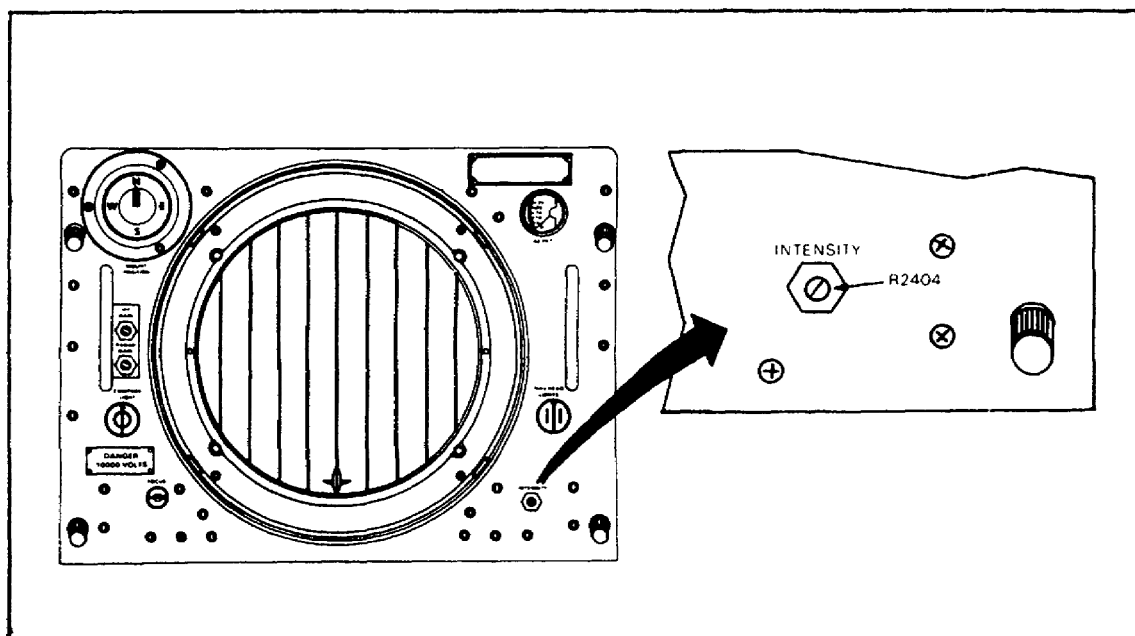


Figure 34. Indicator azimuth-elevation-range IP-800/FPN-40

l. Rotate INTENSITY control R-2404 clockwise on indicator azimuth-elevation-range IP-800/FPN-40 until a time base sweep appears on the CRT (cathode ray tube). (See Figure 35.)

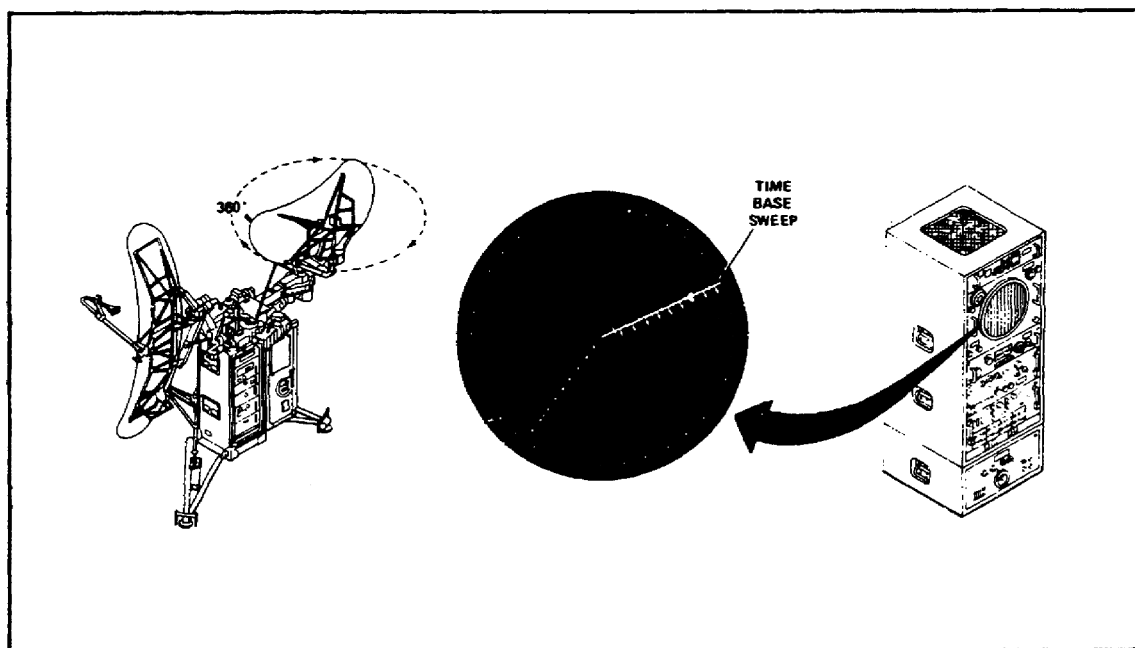


Figure 35. Indicator azimuth-elevation-range IP-800/FPN-40

m. Locate the following on control, radar set C-2074A/FPN-33. (See Figure 36.)

- (1) CURSOR ALIGN switch S2807.
- (2) SURVEILLANCE-FINAL APPROACH-HEIGHT FINDER switch S2802.

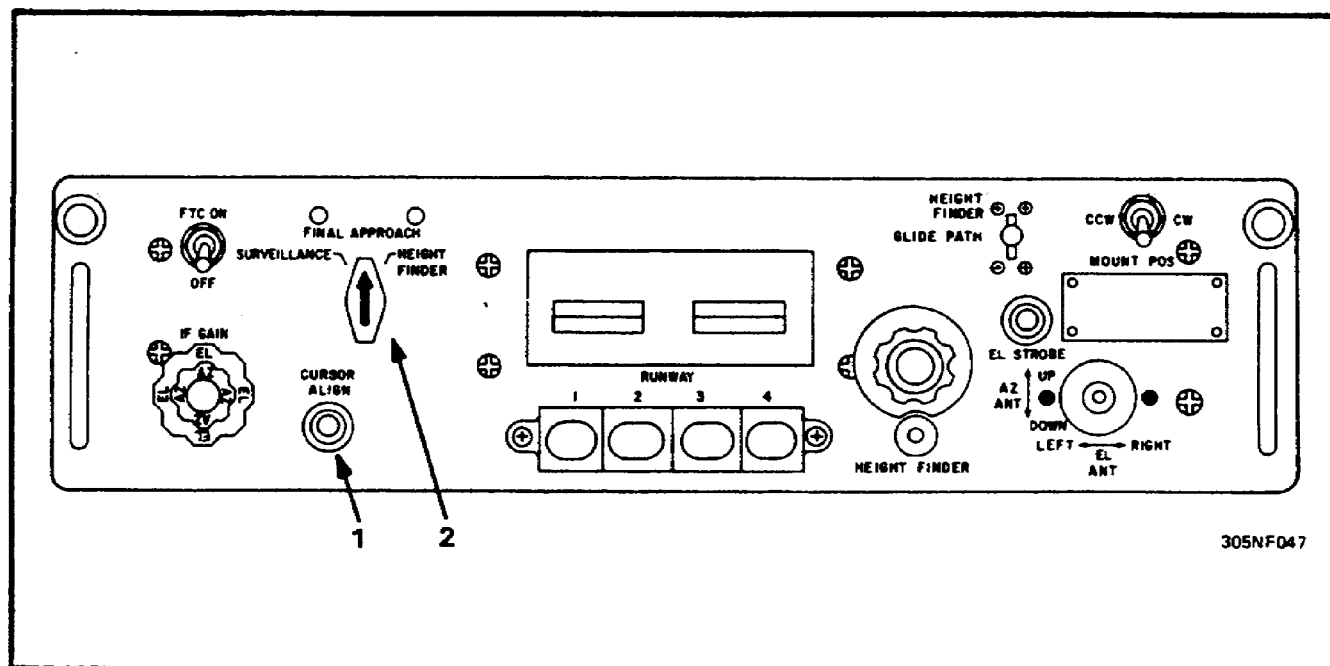


Figure 36. Control, radar set C-2074A/FPN-33.

n. Place the SURVEILLANCE-FINAL APPROACH-HEIGHT FINDER switch S2802 on control, radar set C-2074/FPN-33 to the FINAL APPROACH position. (See Figure 36.)

o. Locate the following on the indicator display of indicator azimuth-elevation-range IP-800/FPN-40. (See Figure 37.)

- (1) Elevation servo strobe.
- (2) Azimuth display.
- (3) Elevation display.

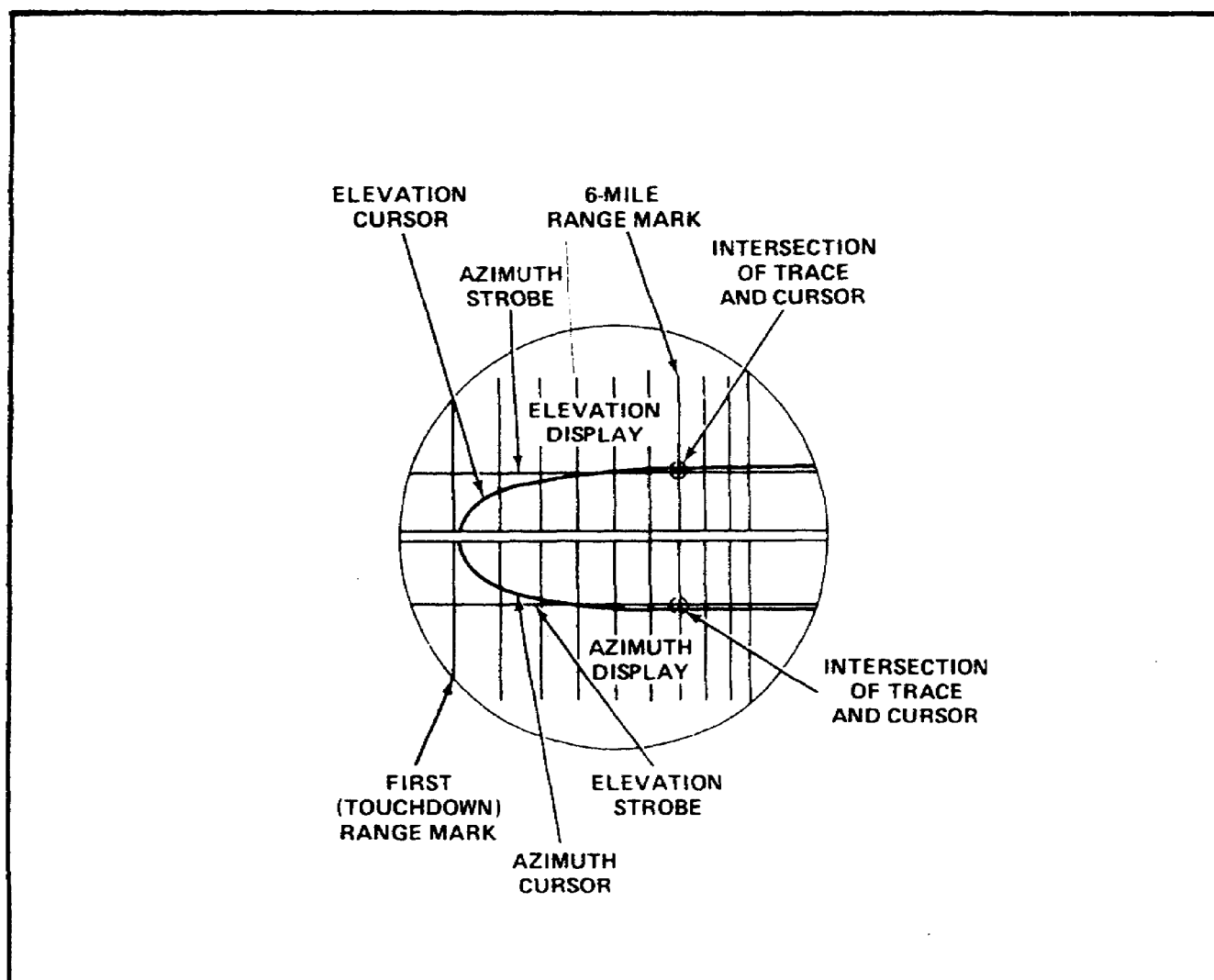


Figure 37. Indicator, azimuth-elevation-range
IP-800/FPN-40.

NOTE: The elevation strobe is a horizontal line which appears on the azimuth display and indicates the horizontal position of elevation antenna AS-1080/FPN-40.

QUESTION: The elevation strobe indicates the _____ position of elevation antenna AS-1080/FPN-40.

p. Depress and hold CURSOR ALIGN switch S2807 on control, radar set C-2074/FPN-33 (Figure 38) and observe the indicator display.

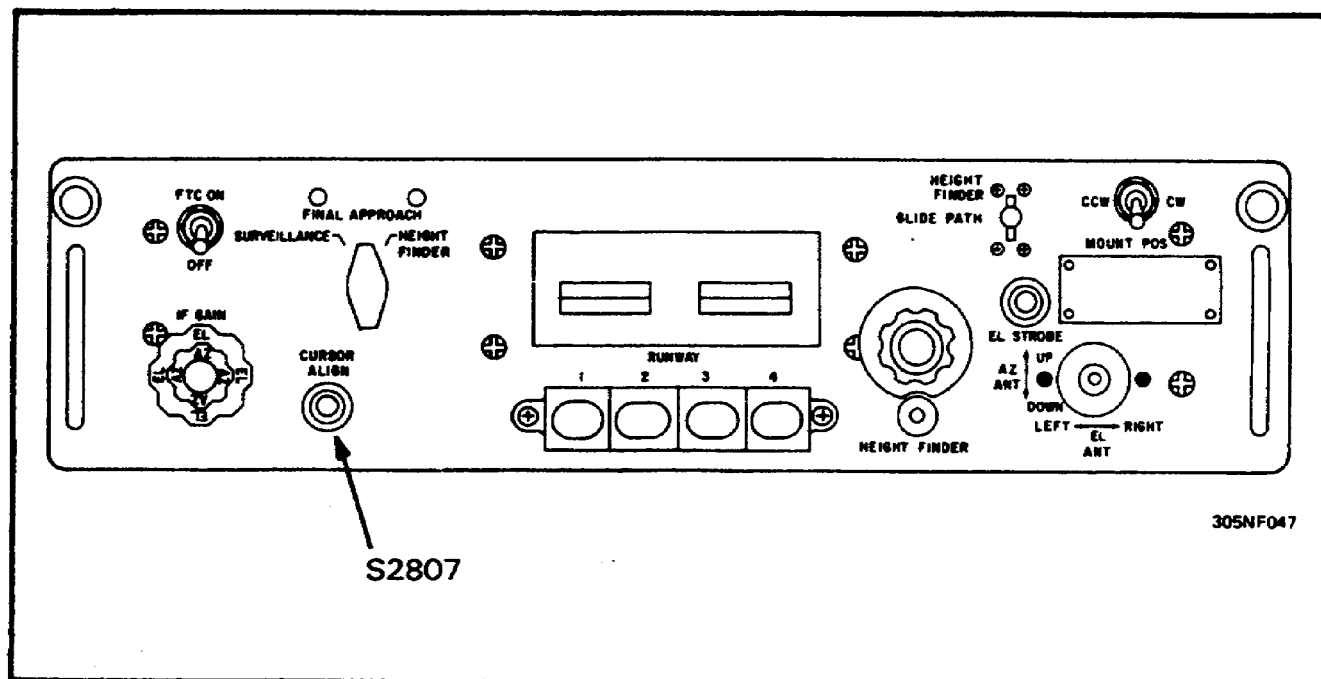


Figure 38. Part of control, radar set C-2074/FPN-33.

NOTE: On the indicator display you will notice a horizontal line alternately appearing in the azimuth and elevation display areas of the CRT (Figure 39). This horizontal line is called a "reference strobe." For this lesson you will only be concerned with the "0 degree reference strobe" located in the azimuth portion of the display.

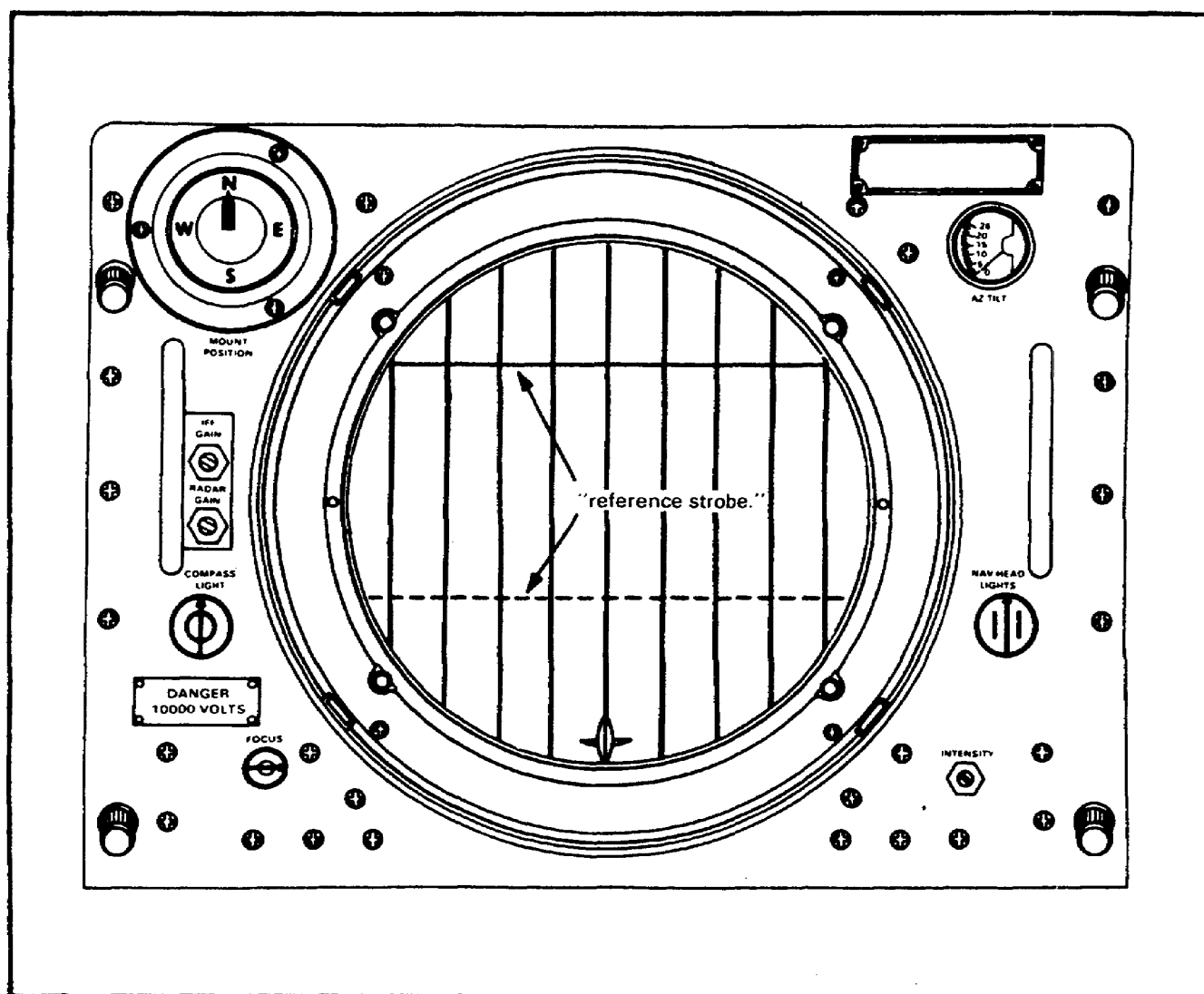


Figure 39. Indicator, azimuth-elevation-range IP-800/FPN-40.

QUESTION: When the CURSOR ALIGN switch S2807 is depressed on control, radar set C-2074/FPN-33, a _____ appears on the indicator display of indicator azimuth-elevation-range IP-800/FPN-40.

q. Release the CURSOR ALIGN switch S2807 on control, radar set C-2074/FPN-33. Notice that the display on indicator, azimuth-elevation-range IP-800/FPN-40 returns to normal. Notice also that where the reference strobe had appeared, there is a "burned in" trace. (See Figure 40.)

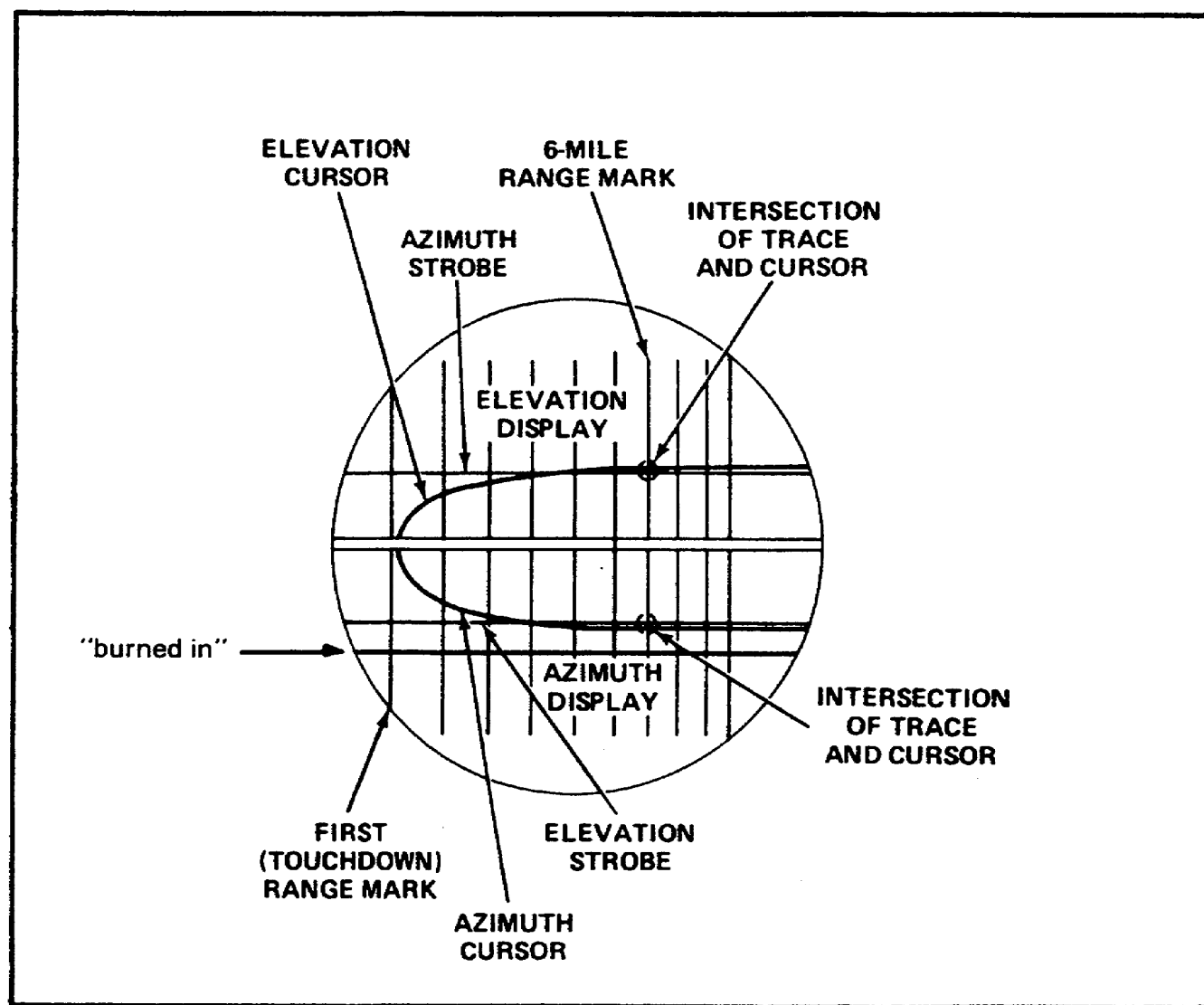


Figure 40. Indicator, azimuth-elevation-range IP-800/FPN-40.

r. Locate and disengage the release handles on computer navigational CP-338/FPN-33 and pull drawer forward to its mechanical stops. (See Figure 41.)

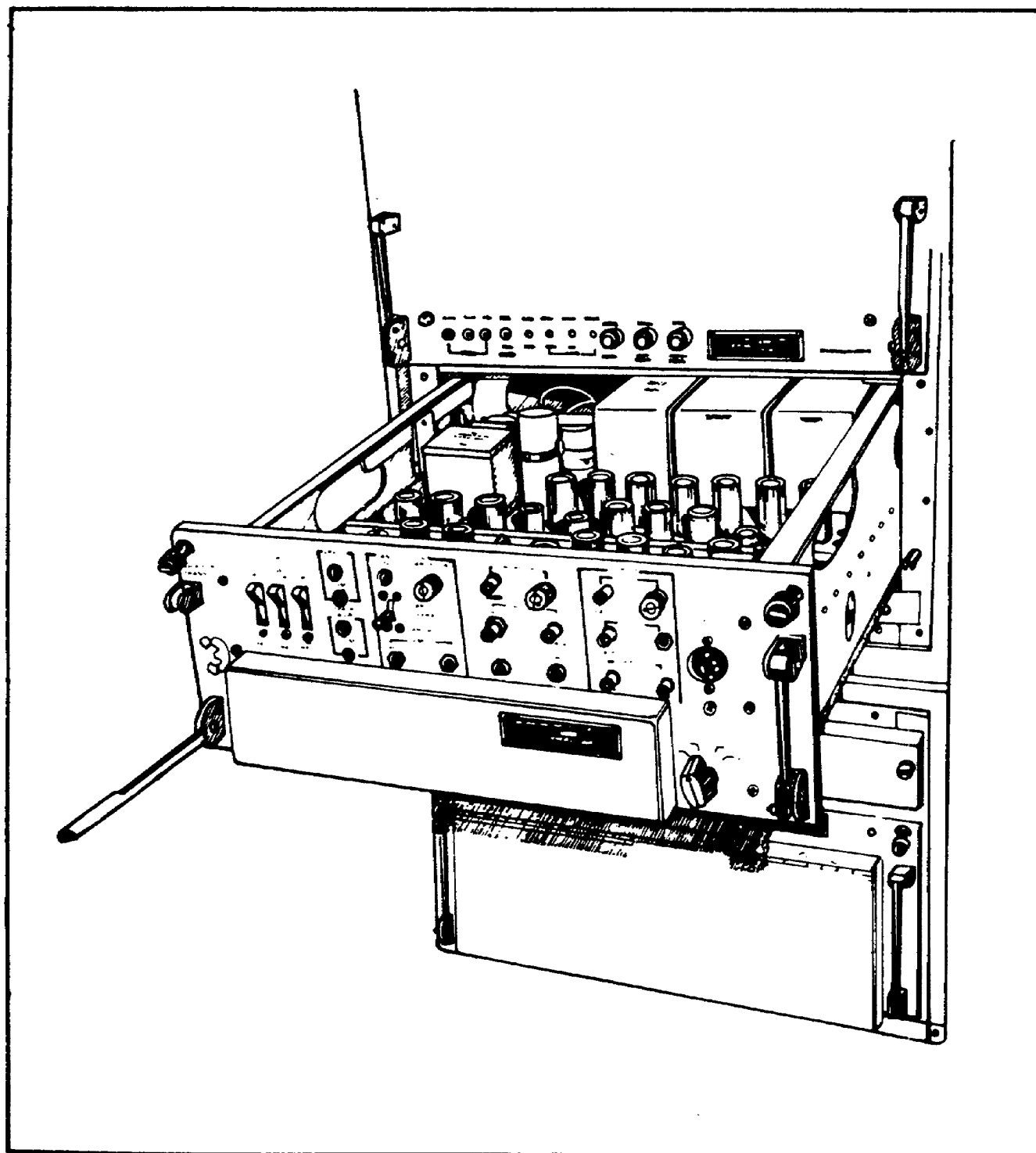


Figure 41. Computer navigational CP-338/FPN-33.

s. Locate the EL STROBE ADJ control R408. It is to the rear and to the left as you are looking down into computer navigational CP-338/FPN-33. (See Figure 42.)

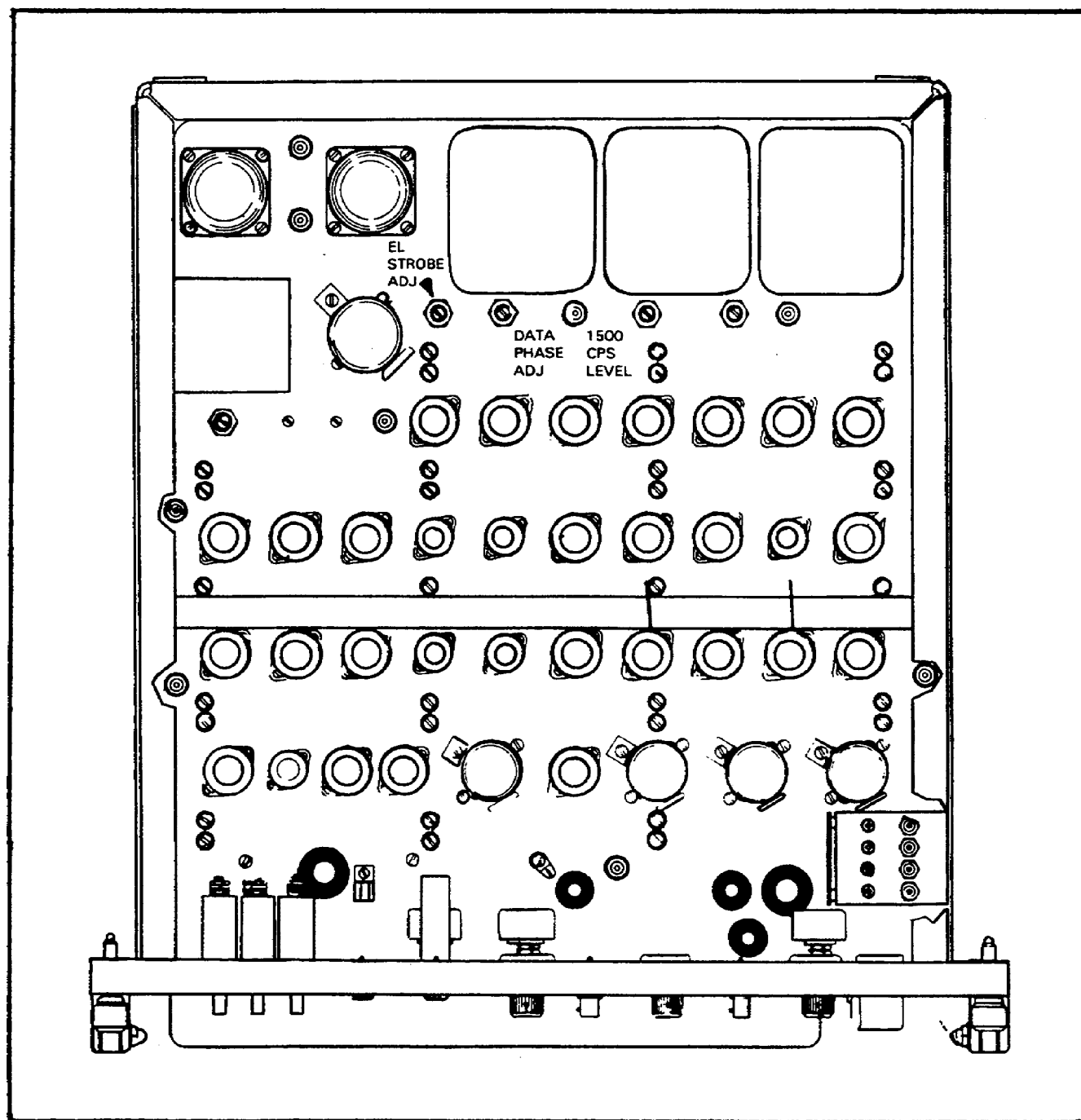


Figure 42. Computer navigational CP-338/FPN-33.

NOTE: The EL STROBE ADJ control R408 located in computer navigational CP-338/FPN-33 is used to align (superimpose) the elevation servo strobe (Figure 37) over the "burned in" reference strobe (Figure 40).

3. Using the following checklist, review the location of the following components and controls. Place a check beside each component or control as you locate them in the previous figures.

- _____ Control indicator group OA-2664/FPN-40 (Figure 3)
- _____ Panel, power distribution SB-1116/FPN-40 (Figure 4)
- _____ Indicator, azimuth-elevation-range IP-800/FPN-40 (Figure 5)
- _____ Control, radar set C-2074/FPN-33 (Figure 6)
- _____ Computer, navigational CP-338/FPN-33 (Figure 25)
- _____ Elevation antenna AS-1080/FPN-40 (Figure 26)
- _____ Control monitor C-2124A/FPN-33 (Figure 26)
- _____ Elevation servo protractor (Figure 27)
- _____ LOCAL-REMOTE switch S4203 (Figure 28)
- _____ SCAN switch S4201 (Figure 28)
- _____ EL ANT SERVO switch S4205 (Figure 28)
- _____ SCAN switch S305 (Figure 32)
- _____ INTENSITY control R2404 (Figure 34)
- _____ CURSOR ALIGN switch S2807 (Figure 36)
- _____ SURVEILLANCE-FINAL APPROACH-HEIGHT FINDER switch S2802 (Figure 36)
- _____ Elevation servo strobe (Figure 37)
- _____ Azimuth display (Figure 37)
- _____ Elevation display (Figure 37)
- _____ Computer, navigational CP-338/FPN-33 release handles (Figure 41)
- _____ EL STROBE ADJ control R408 (Figure 42)

Learning Event 3:

ADJUST THE B-TRIGGER DELAY OF RADAR SET AN/FPN-40

1. Learning Event 3 will enable you --
 - a. To learn the function and use of the B-trigger.
 - b. To use synchroscope.
 - c. To adjust of the B-trigger delay.
2. Location and initial setting of components and controls.
 - a. Locate and identify receiver-transmitter group OA-2667/FPN-40. (See Figure 43.)

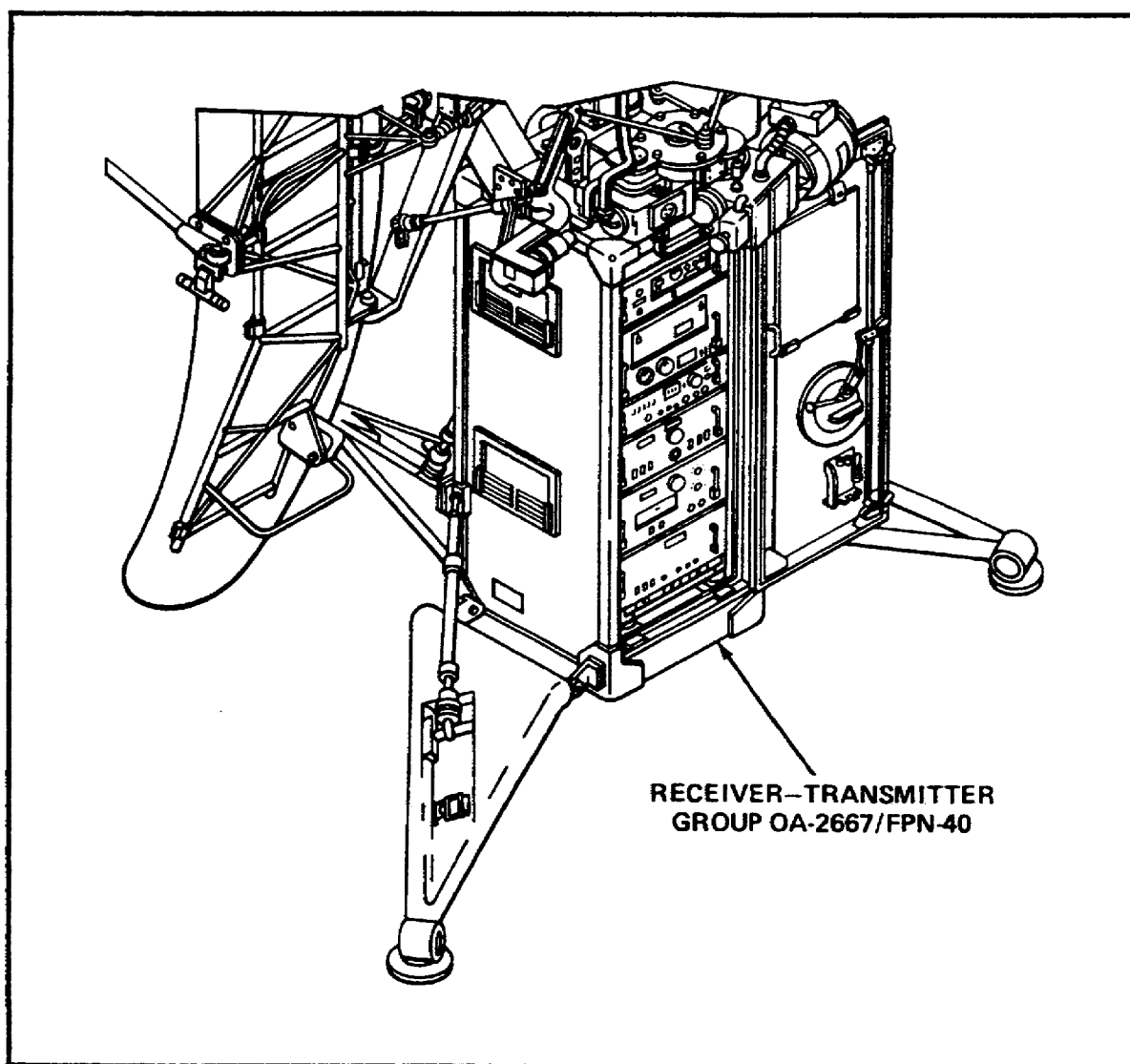


Figure 43. Receiver-transmitter group OA-2667/FPN-40.

b. Locate and identify receiver, radar chassis R-981/FPN-40; transmitter, radar T-749A/FPN-40 chassis; and control, monitor chassis C-2124A/FPN-33 on receiver-transmitter group OA-2667/FPN-40. (See Figure 44.)

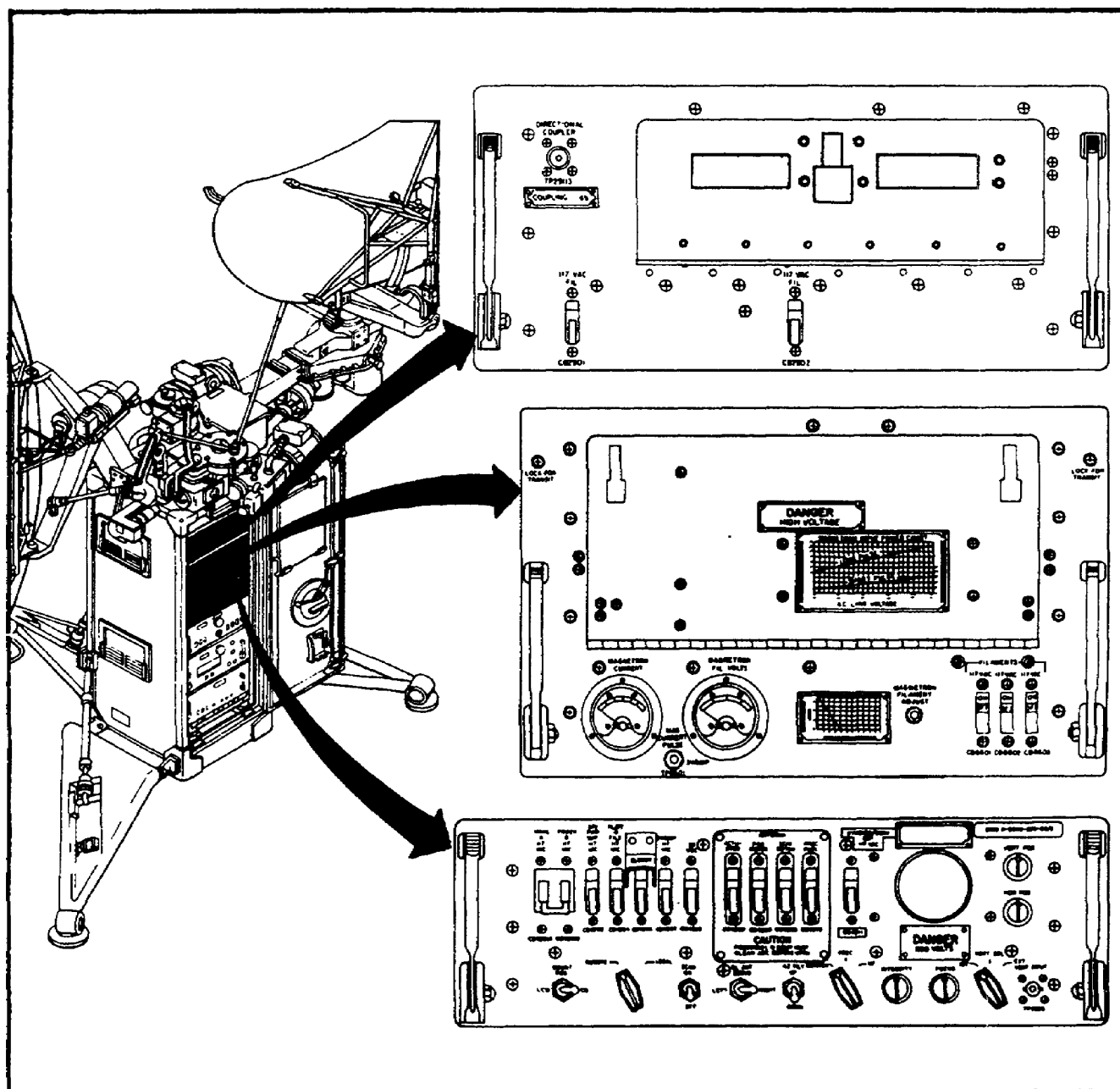


Figure 44. Receiver, transmitter, and control.

NOTE: On receiver chassis and transmitter chassis, it will be necessary for you to push the quick release latches and pull down the panel covers for access to controls and test points. (See Figure 45.)

c. Locate and release latches on the panel covers of the receiver chassis and transmitter chassis. (See Figure 45.)

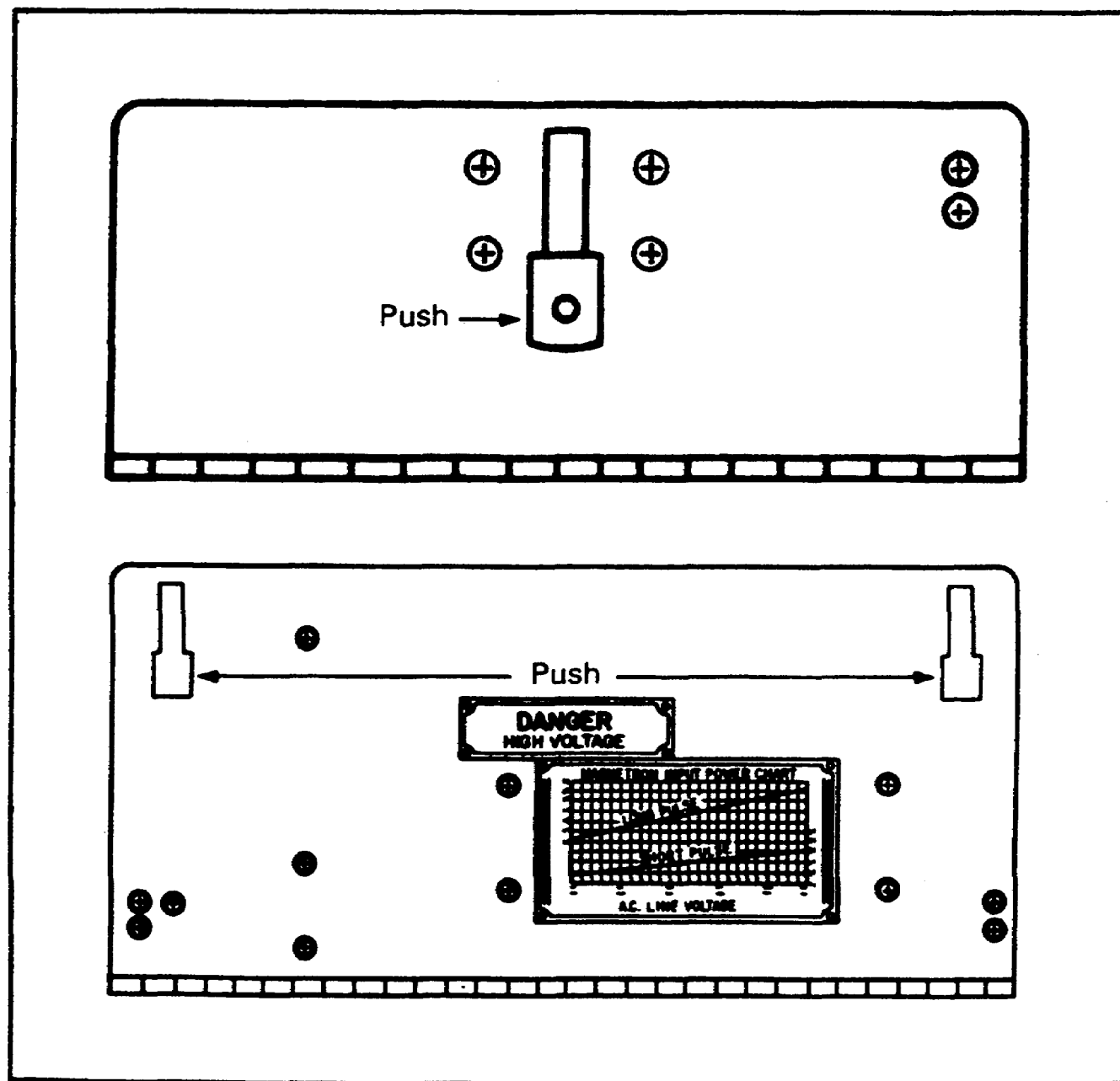


Figure 45. Panel covers.

d. Locate trigger test point TP-2905 of receiver radar R-981/FPN-40.
(See Figure 46.)

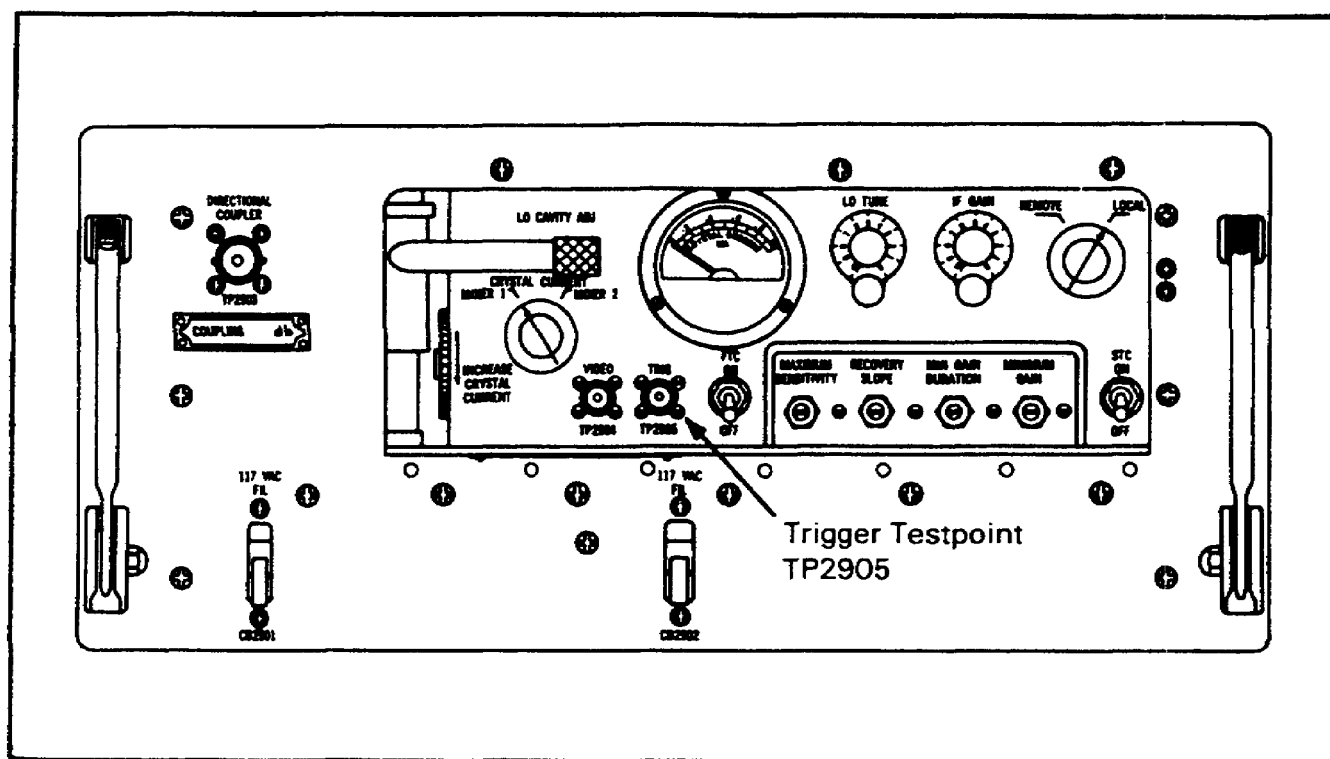


Figure 46. Receiver, radar R-981/FPN-4.

e. Locate the pulse delay oscillator mounted on the inside of the panel cover of transmitter radar T-749A/FPN-40. (See Figure 47.)

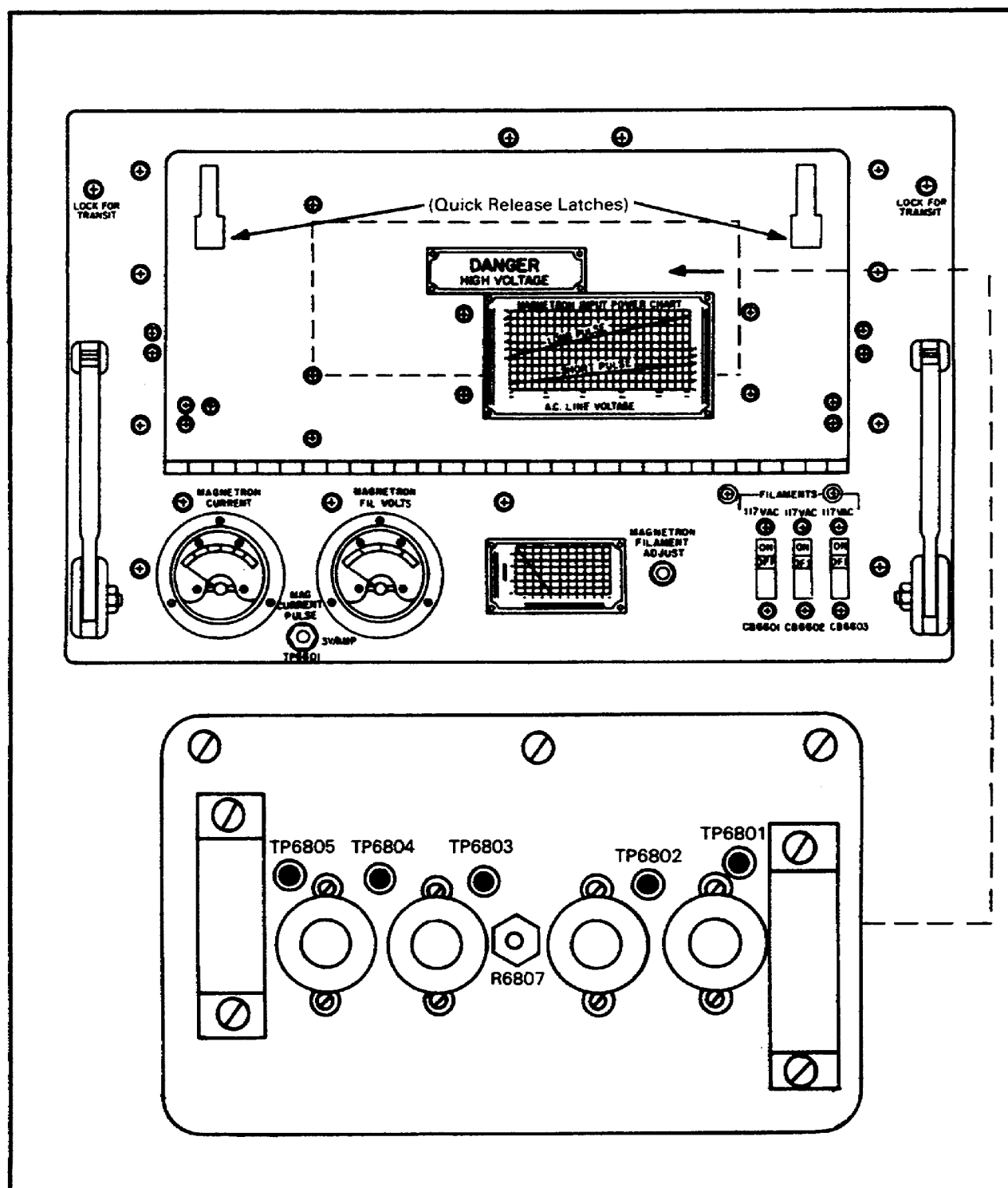


Figure 47. Transmitter, radar T-749A/FPN-40 and pulse delay oscillator.

f. Locate TP-6802, B-trigger delay gate test point and R6807, B-trigger delay adjust pulse delay, 0-1284/FPN. (See Figure 48.)

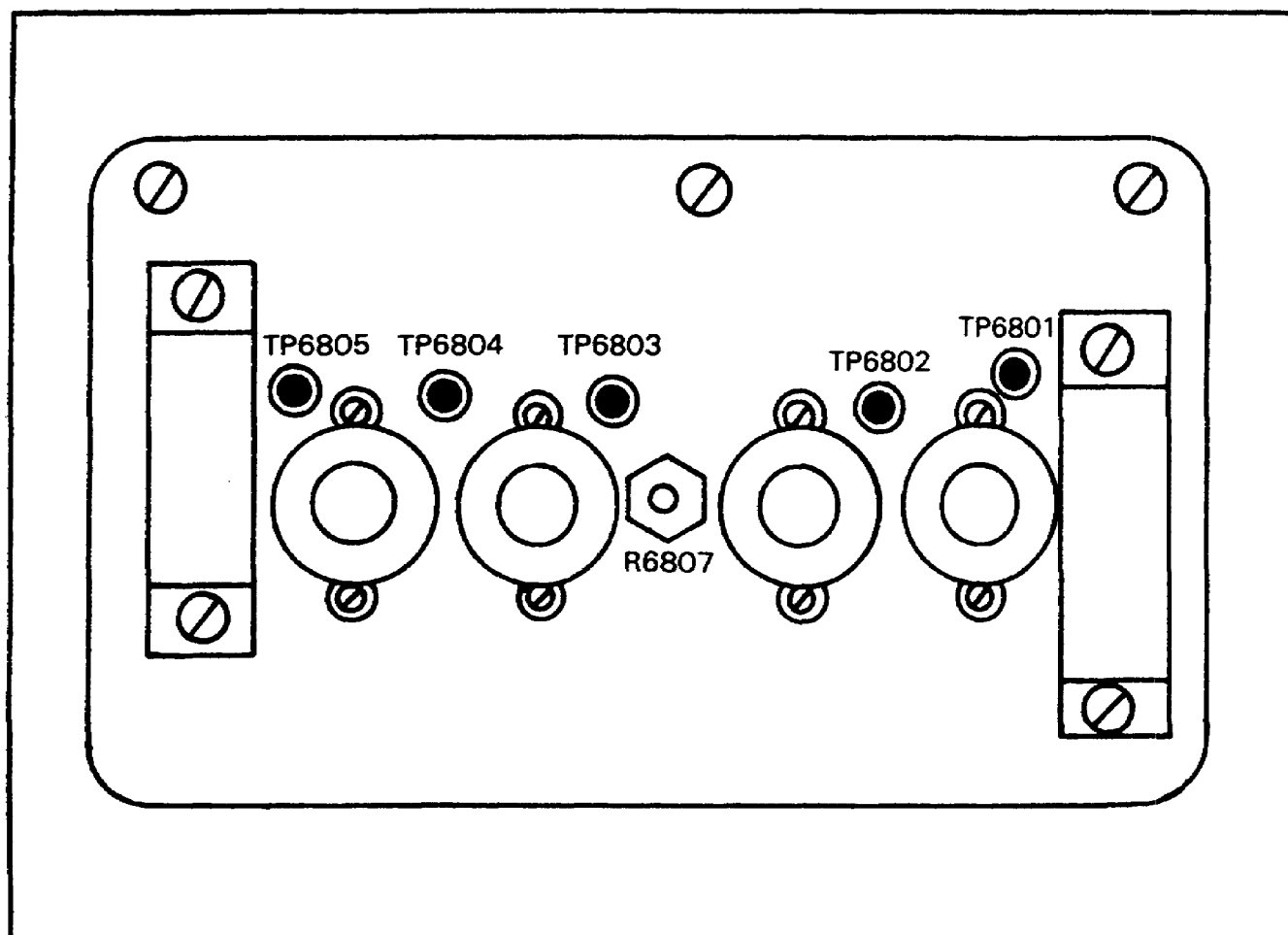


Figure 48. Oscillator, pulse delay, 0-1284/FPN (top view).

g. Connect oscilloscope from external trigger jack on the oscilloscope to the trigger test point TP-2905 on the receiver radar, R-981/FPN-40. (See Figure 49.)

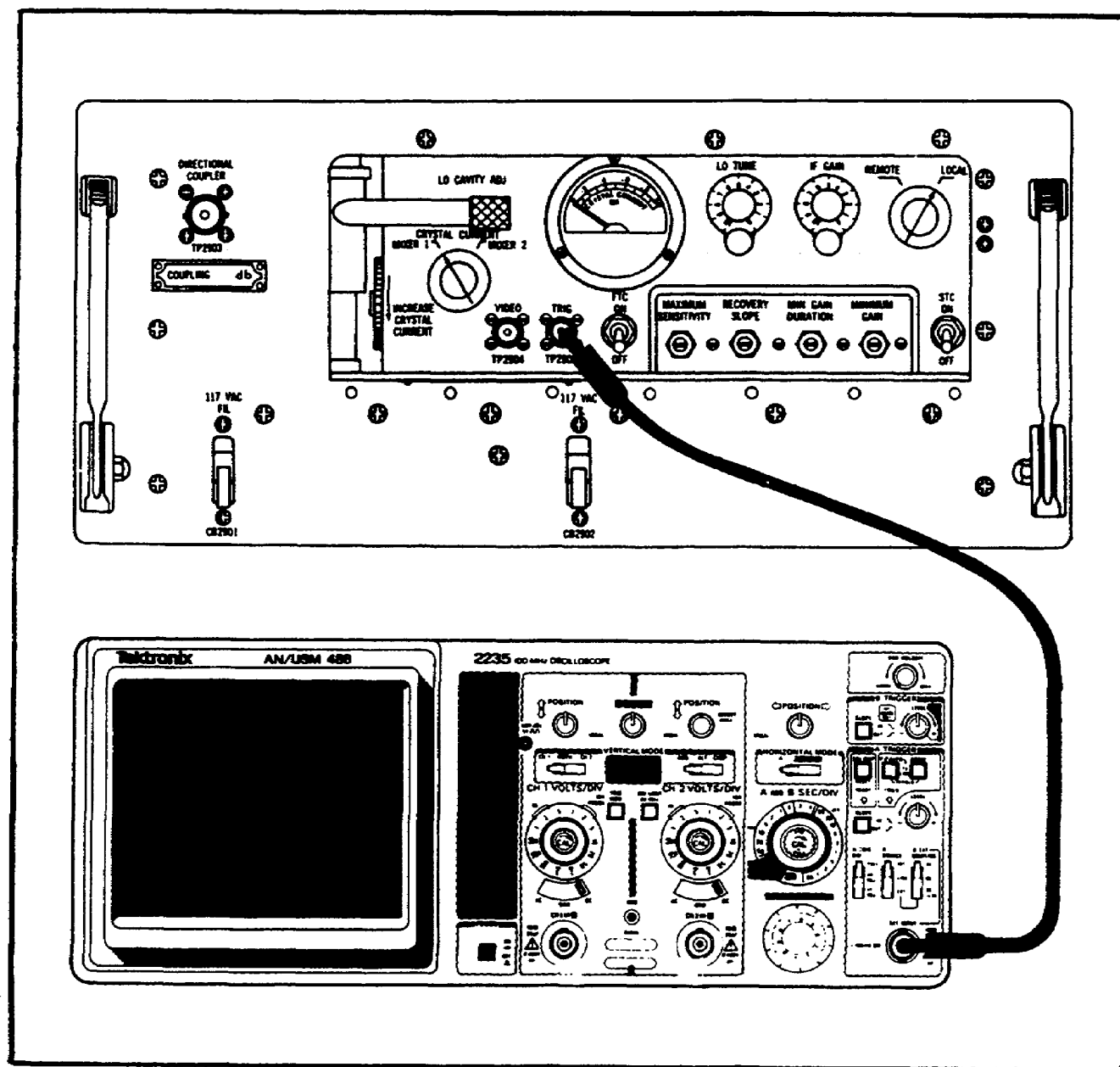


Figure 49. Oscilloscope to TP-2905.

h. Adjust the sweep and intensity and properly sync the oscilloscope with the radar system trigger.

i. Connect the oscilloscope from the vertical input jack on the oscilloscope to the delay gate test point TP-6802 on the pulse delay oscillator O-1284/FPN and observe the delay gate. (See Figure 50.)

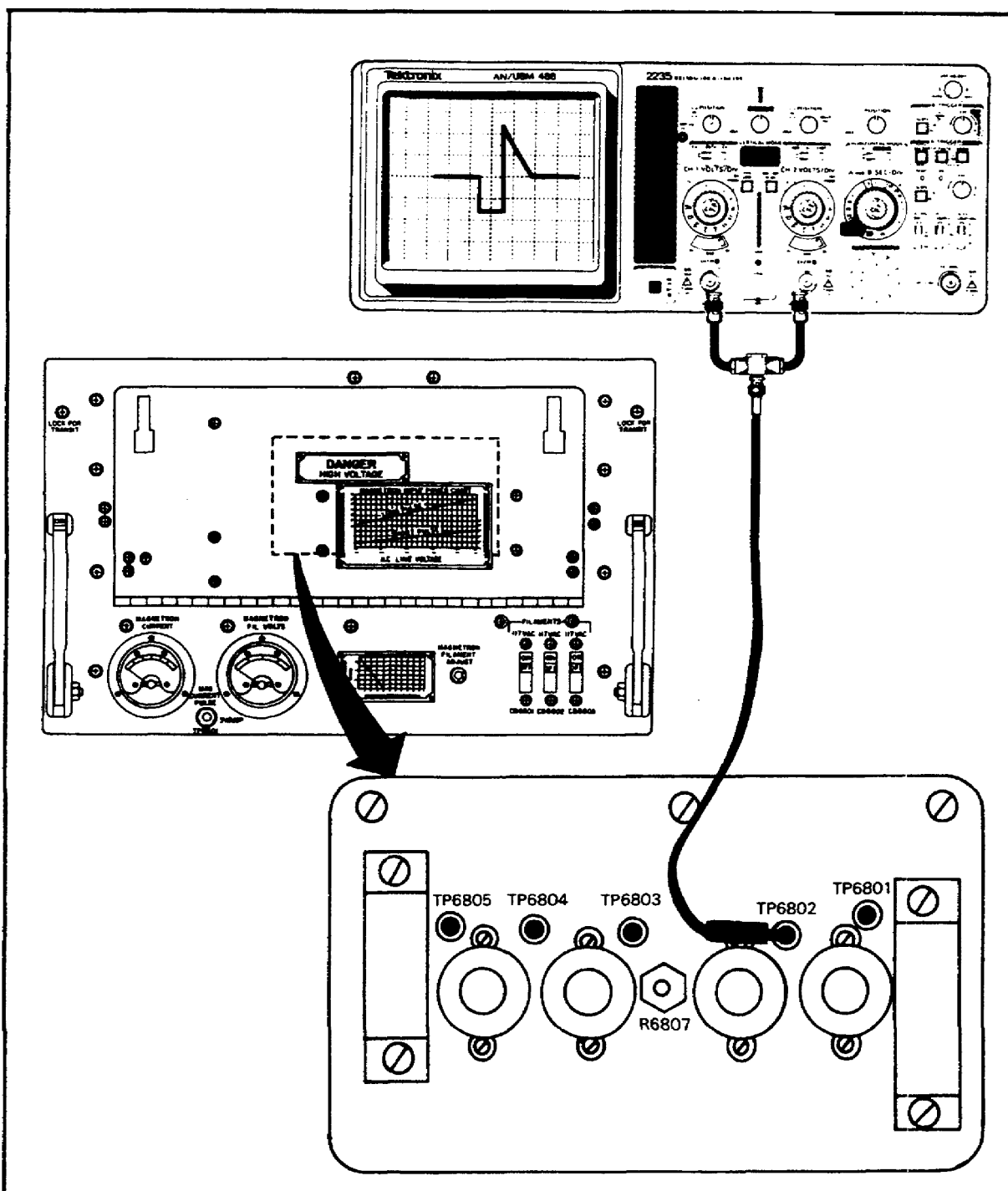


Figure 50. Oscilloscope to TP-6802.

QUESTION: Is oscilloscope still synchronized to give you a good oscilloscope sweep presentation?

ANSWER: _____

j. Adjust the B-trigger delay R6807 while observing the oscilloscope and adjust the delay gate for a pulse width of 120 microseconds. (See Figure 51.)

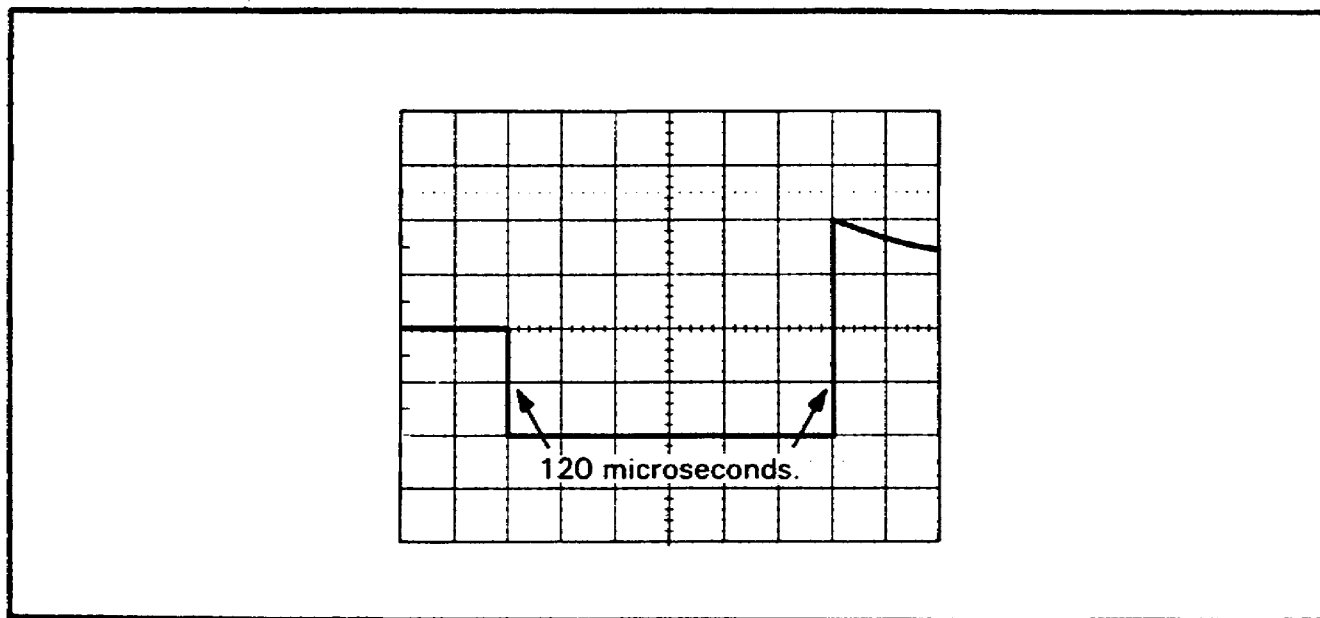


Figure 51. Adjustments of delay R6807 and delay gate.

QUESTION: Did the leading or lagging edge of the gate move when adjusting R6807?

ANSWER: _____

k. Disconnect the oscilloscope from TP-2905 on the receiver chassis and TP-6802 on the pulse delay oscillator.

l. Locate the control monitor, C2124A/FPN-33. (See Figure 44.)

NOTE: If an oscilloscope was not available, this task could be preform by using the synchroscope on the control monitor, C2124A/FPN-33, this procedure will be completed by operating the following controls as you read their functions.

(1) Figure 52 shows the part of the control monitor that has the synchroscope and its controls.

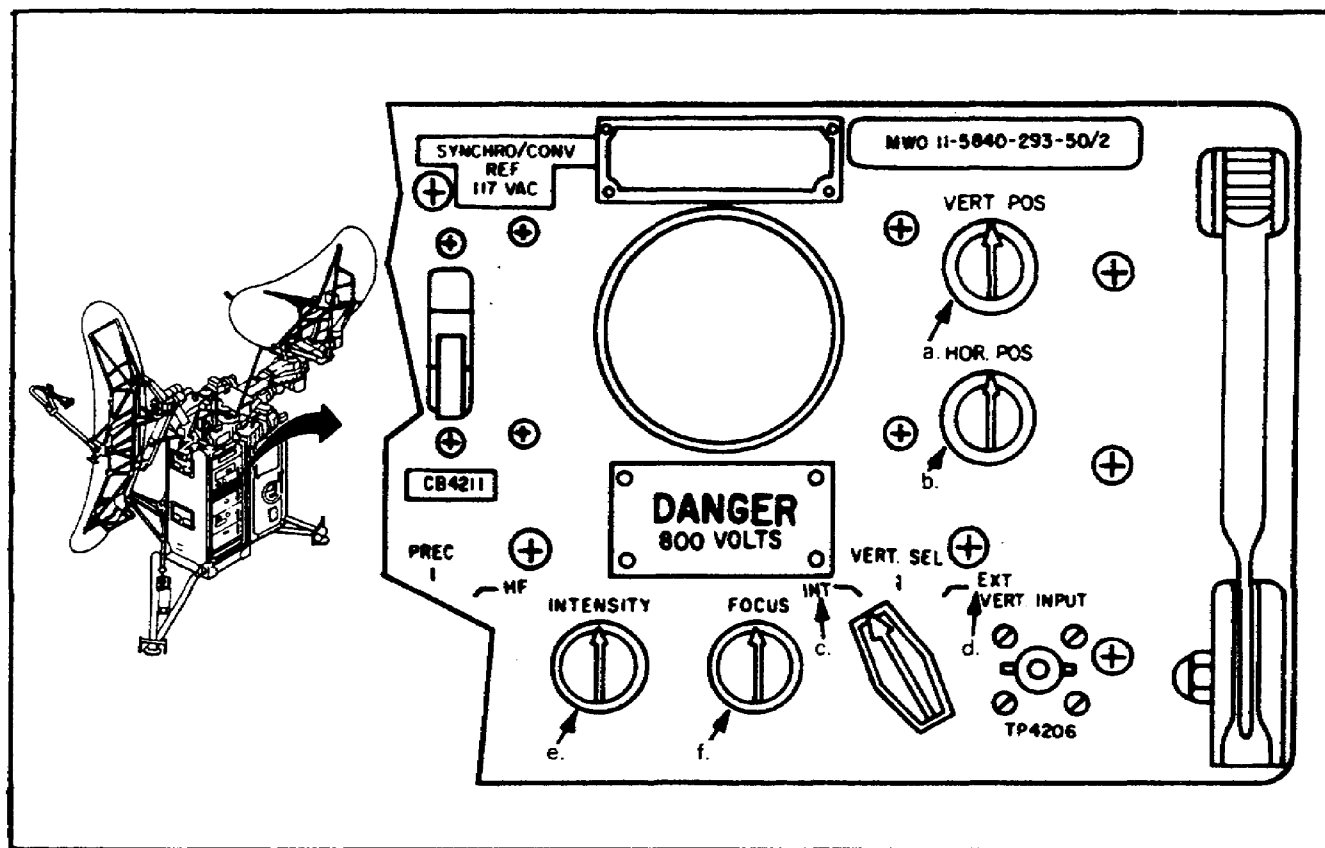


Figure 52. Synchroscope and its controls.

(2) The function of the controls on the synchroscope as indicated in Figure 52 are as follows:

(a) VERT POS control - Controls the vertical position of the sweep trace on the CRT. When you turn the VERT POS control clock-wise, then counterclockwise, the sweep trace on the CRT moves up and down.

QUESTION: When you turned the VERT POS control clockwise then counterclockwise, sweep trace moved _____ and _____.

(b) The HOR POS control determines the horizontal position of the sweep trace on the CRT. When you turn the HOR POS control clockwise then counterclockwise, the sweep trace moves left and right.

QUESTION: When you turned the HOR POS control clockwise then counterclockwise, trace moved _____ and _____.

(c) The INT position of the VERT SEL switch determines that the video signals from the radar receiver R-981/FPN-40 will be displayed on the CRT.

(d) The EXT position permits the display of an external signal when using the VERT input TP-4206.

NOTE: To align the local oscillator you must observe the video signal on the CRT of the synchroscope; VERT SEL switch must be in the INT position.

QUESTION: The VERT SEL switch is placed in the INT position to observe the _____ from the radar receiver, R-981/FPN-40 on the synchroscope's CRT.

(e) The INTENSITY control determines the brightness of the display on the CRT. The intensity control should be adjusted so the sweep or signals presented on the CRT can be observed.

(f) The FOCUS control determines the sharpness of the display on the CRT. The focus control should be adjusted for the (finest) or sharpest display.

m. On control monitor C-2124/FPN-33, connect VERT input test point TP-4206 to B-trigger output test point TP-6805 on 0-1284/FPN chassis. (See Figure 53.)

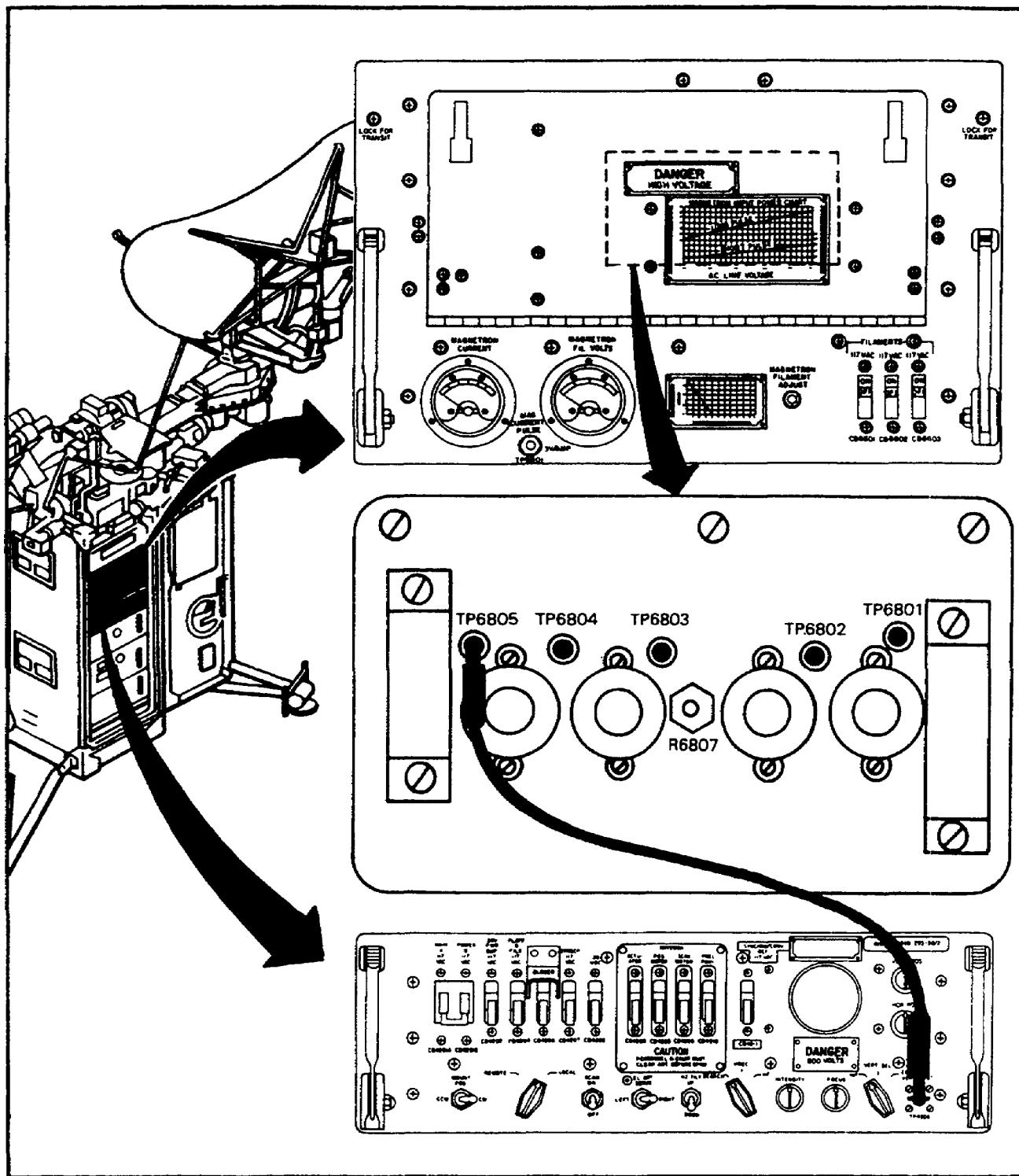


Figure 53. TP-4206 to TP-6805.

QUESTION: Is B-trigger display present on synchroscope?

ANSWER: _____

n. Adjust VERT POS, HOR POS, INTENSITY and FOCUS controls as required to obtain a clear display on the CRT in control-monitor C-2124/FPN-33. (See Figure 54.)

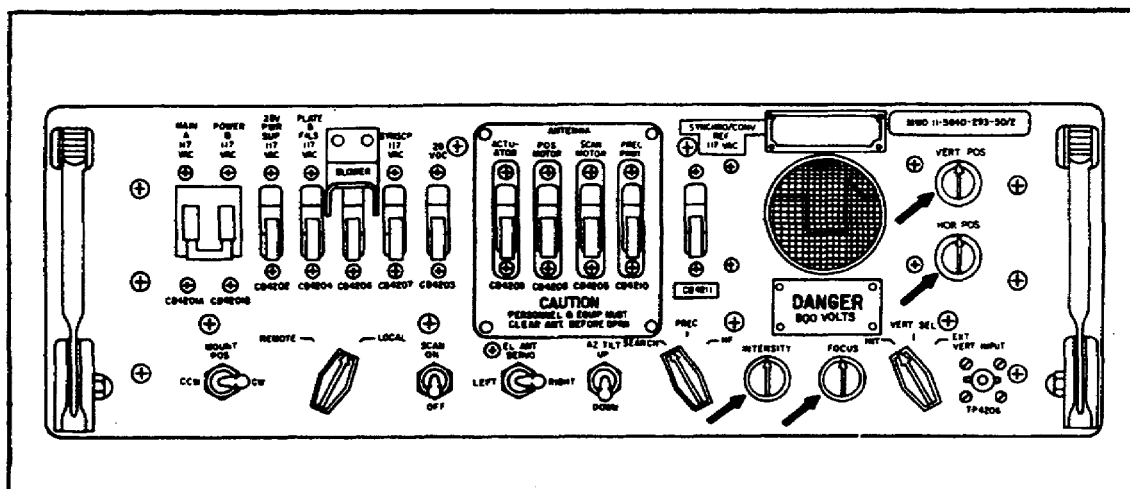


Figure 54. Adjustment of VERT POS, HOR POS, Intensity, and FOCUS controls.

p. On 0-1284/FPN chassis, rotate B-trigger delay adjust control R-6807 through its full range while observing test synchroscope. (Note the two extreme positions of the trigger delay gate on the CRT of C-2124/FPN-33.) (See Figure 55.)

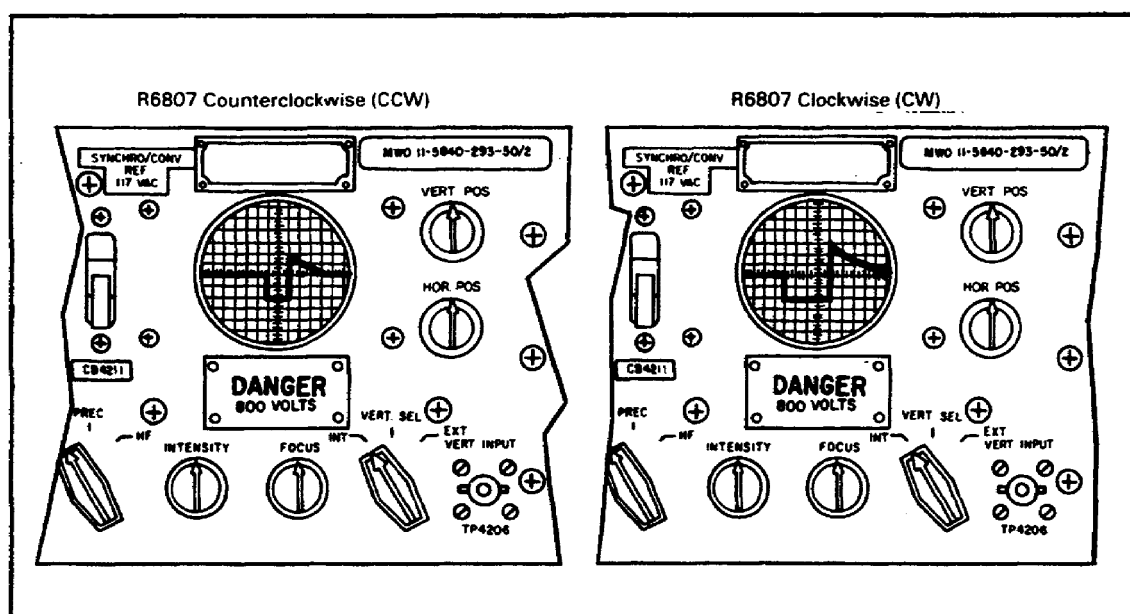


Figure 55. B-trigger delay adjust control R-6807, full range.

q. Adjust B-trigger delay adjust control R-6807 until the gate is set to the midpoint of the two extremes. (See Figure 56.)

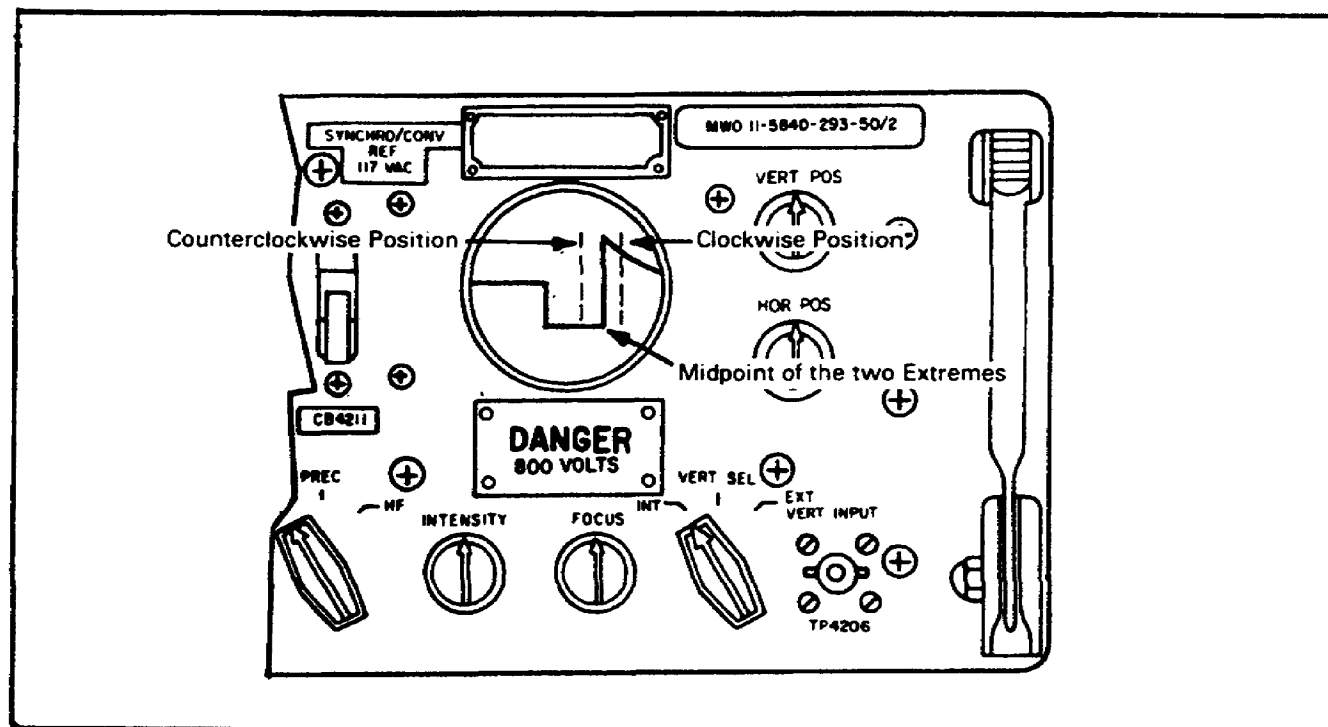


Figure 56. B-trigger delay adjust control R-6807, midpoint.

QUESTION: What does R-6807 control?

ANSWER: _____

QUESTION: B-trigger delay gate is adjusted to microseconds when using oscilloscope AN/USM-281 and to when using the test synchroscope on control-monitor C-2124A/FPN-33.

r. Connect the trigger test point TP-2905 on receiver, radar R-982/FPN-40 to the external input jack on the oscilloscope and make the necessary adjustments to prepare the oscilloscope. (See Figure 49.)

s. Connect the vertical input jack of the oscilloscope to the delay gate test point TP-6802 on the pulse delay oscillator 0-1284/FPN and observe the delay gate. (See Figure 50.)

t. Adjust the B-trigger delay adjust R-6807 for 120 microseconds while observing oscilloscope AN/USM-281. (See Figure 51.)

3. You have completed the B-trigger delay adjust adjustment. In doing so, you have ensured the proper triggering of the thyatron modulator to control the timing of the transmitted pulse. Restore the radar set to its operating condition by disconnecting all test equipment and securing the panel covers.

4. Using the following checklist, review the location of the following components and controls. Place a check beside each component or control as you locate them in the previous figures.

- _____ Receiver-transmitter group OA-2667/FPN-40 (Figure 43)
- _____ Receiver-radar R-981/FPN-40 (Figure 44)
- _____ Transmitter-radar T-749A/FPN-40 (Figure 44)
- _____ Control-monitor C-2124A/FPN-33 (Figure 44)
- _____ Release latches on receiver and transmitter panel covers (Figure 45)
- _____ Trigger test point TP-2905 on receive chassis (Figure 46)
- _____ Pulse delay oscillator assembly O-1284/FPN (Figure 47)
- _____ B-trigger delay gate test point TP-6802 (Figure 48)
- _____ B-trigger delay gate adjust control R-6807 (Figure 48)
- _____ VERT POS control on control-monitor C-2124A/FPN-33 (Figure 54)
- _____ HOR POS control on control-monitor C-2124A/FPN-33 (Figure 54)
- _____ Intensity control on control-monitor C-2124A/FPN-33 (Figure 54)
- _____ Focus control on control-monitor C-2124A/FPN-33 (Figure 54)
- _____ VERT input test point TP-4206 on control-monitor C-2124A/FPN-33 (Figure 53)